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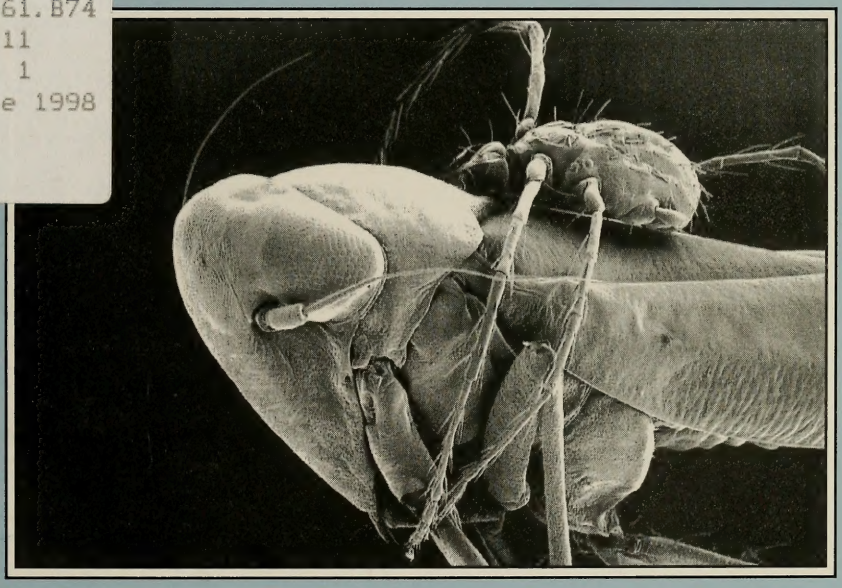

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CATHAROSIA PYGMAEA (FALLÉN) (DIPTERA: TACHINIDAE) NEW TO BRITAIN

STEVEN FALK

Herbert Art Gallery and Museum, Jordan Well, Coventry CV1 5RW.

Belshaw (1993) listed 241 species of tachinid flies as British, though the relative lack of popularity of this rather challenging fly family provides real opportunities for discovering further species where plenty of material is retained. Within vice-county Warwickshire, where I have made special efforts to accumulate records of tachinids since 1990, the county list currently stands at just over one hundred species, though this figure rises steadily each year. A good number of Nationally Scarce and a few Red Data Book species are to be found here, but the most interesting species to date came to light in the summer of 1996.

During this summer, an entomological survey was carried out along a disused railway line running through the heavily urbanized Lower Stoke area of Coventry. This was part of a wide-ranging environmental appraisal investigating the potential impacts of a proposed road scheme that is already partially completed along the former route of this same disused railway. On 17 July two specimens of an unusual looking, small tachinid were swept from an area of rank grassland, tall herb and invading birch and sallow scrub on made-up ground that receives the normal disturbance of dog-walking, cycling, fly-tipping and arson that one comes to expect on informal urban green-space.

They represented a male and female, displaying strong sexual dimorphism, yet clearly conspecific on the basis of a number of features, including wing venation and wing clouding, both of which rather resemble the rhinophorid *Melanophora roralis* (L.). The well-formed subscutellum and meral (hypopleural) setae clearly indicated a tachinid, but attempts to key the specimens out using Belshaw (*loc. cit.*) and van Emden (1954) proved fruitless. A visit was subsequently made to The Natural History Museum, London, where, using the world tachinid collection under the guidance of Nigel Wyatt, it was concluded that the specimens represent *Catharosia pygmaea* (Fallén), a species and genus hitherto unknown in Great Britain. A further male specimen was obtained in the same general area as the first two specimens on 31 July after prolonged sweeping of grassland and other low herbage.

C. pygmaea is a member of the subfamily Phasiinae and tribe Catharosiini. Its closest relative in Britain is the rare *Litophasia hyalipennis* (Fallén), which somewhat resembles *C. pygmaea* in size and build but has unclouded wings, a less sharply angled upper cross vein and a poorly differentiated subscutellum. *C. pygmaea* has been recorded from scattered localities across Europe as far north as Sweden, also from several parts of the former USSR, Israel and Mongolia (Herting & Dely-Draskovitz, 1993).

Herting & Dely-Draskovitz listed four species of *Catharosia* in the Palaearctic region and Kugler (1977) provided a key to these. *C. albisquama* (Villeneuve, 1932) is a tiny species, scarcely 2 mm long with uniformly smoky wings, and has been recorded in Europe from Germany, Spain and Hungary. *C. flavicornis* (Zett.) more closely resembles *C. pygmaea* in size (about 3.5–4.0 mm long) but has yellow and brown rather than black antennae, highly reduced palpi and a male frons that is as wide as an eye (very narrow in *C. pygmaea*). It has been recorded in Europe from France, Hungary, Poland and Sweden. Both of these species could conceivably turn

up in Britain. The fourth species, *C. claripennis* Kugler, 1977, is only recorded from Israel. The genus is also represented in the Afrotropical, Nearctic, Neotropical and possibly Oriental Regions.

The north American *C. lustrans* (Reinhard, 1944) which, on the basis of the illustration in the Manual of Nearctic Diptera, appears to be very similar to *C. pygmaea*, has been reared from various lygaeid bugs (Arnaud, 1978). The Coventry specimens were swept from floristically diverse ruderal grassland, tall herb or scrub foliage supporting the following lygaeids: *Drymus sylvaticus* (Fab.), *Heterogaster urticae* (Fab.), *Kleidocerys resedae* (Panzer), *Peritrechus geniculatus* (Hahn), *Scolopostethus affinis* (Schilling), *S. grandis* Horvath and *Taphropeltus contractus* (H.-S.).

It is perhaps also worth noting that the second male was observed performing tephritid-style wing displays whilst still alive in the pooter. This is a most unusual habit for a tachinid, and suggests that the clouded wings with milky-white apical wing spots may be used for courtship. *Phania funesta* (Meigen), *Subclytia rotundiventris* (Fallén) and *Dionaea aurifrons* (Meigen) also hold their wings wide apart when at rest and males of *D. aurifrons* appear to have a complex courtship involving erratic, swarming flight over rough grassland (Assis-Fonseca, 1949).

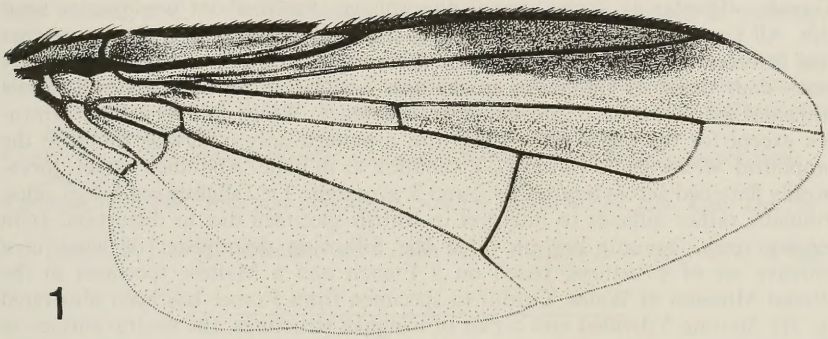
Identification and description

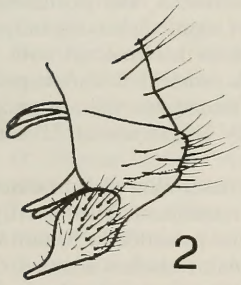
Both sexes run to couplet 95 in Belshaw's Handbook, at which point they do not fall comfortably into either couplet 96 (abdomen without distinct bristles) or couplet 97 (abdomen with numerous easily distinguishable bristles). However, both sexes can be separated from all other species between couplets 95 and 105 by the presence of milky-white apical wing spots, contrasting with an otherwise entirely dark wing membrane (female) or a dark smudge in the subcostal area of the wing (male).

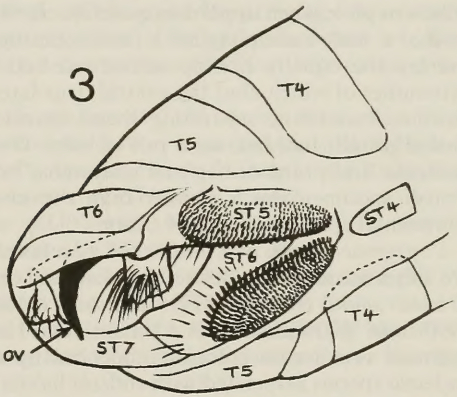
Male.—Small (body length 3.0–4.0 mm), shining black species without any conspicuous dusting (except on sides of face) and with rather weak bristles. Rather resembles the common rhinophorid *Rhinophora lepida* (Meigen, 1824) in build.

Head: Frons about width of fore tibia, frontal orbits largely shining black with little dusting, separated from each other by the matt black interfrontalia which occupies about one-third the width of the frons throughout its length. Approximately 10 pairs of rather weak, crossed frontal bristles extending down to the level of the insertion point of the antennae. Lower part of frontal orbits and parafacialia heavily dusted whitish when viewed from above. Parafacialia about width of third antennal segment at top narrowing to only half of this width at the bottom. In side view, antennae inserted low for a tachinid at about the mid-point of the eye. Jowls very narrow, scarcely half the width of the third antennal segment when viewed strictly laterally, thus the eyes occupy much of the head capsule. Vibrissae well differentiated and 3–4 setae on lower part of facial ridge above. Jowls and occiput lightly grey-dusted with entirely black hairs. A pair of short ocellar setae and stronger vertical setae present. Antennae black, third segment about twice as long as second. Arista bare. Eyes bare.

Thorax: Mesonotum and pleurae shining black and scarcely dusted. Dorsocentrals differentiated (one presutural and three postsutural pairs) but rather weak. Acrostichals not differentiated and hairs of disc sparse and not arranged in rows. All thoracic vestiture black. Other differentiated bristle pairs include humerals (2–4), presuturals (1), notopleurals (2), prealars (1), interalars (1–2), postalars (2), basal scutellars (1) and crossed apical scutellars (1). Length of the latter two pairs approximately that of the scutellum length. Meral setae and postscutellum clearly







Figs 1–3. *Catharosia pygmaea*. 1. Forewing of male. 2. Male genitalia, lateral view. 3. Female genitalia, oblique lateral view, ov = ovipositor.

differentiated. Halteres dark. Lower calypter smoky black, diverging away from the scutellum, contrasting with the milky white upper calypter.

Legs: Entirely black with moderately lengthened femoral bristles, but tibiae with few rather weak bristles, none longer than width of the tibia.

Wings (Fig. 1): Distinct blackish smudge in subcostal area beyond subcosta in front of cell r_{4+5}. Wing tip beyond vein M milky white, forming a conspicuous spot when viewed against a dark background. Remainder of wing membrane with a less conspicuous grey tint that becomes darker in cell r_{4+5} and in the basal subcostal area. Vein M sharply curved towards tip, joining vein R_{4+5} well before wing tip, leaving a long stalk subequal to length of crossvein m–cu. 1–2 bristles on node of vein R_{4+5}. No subcostal spine. Costal breaks just distal to the humeral cross vein and immediately before junction of costal and subcostal veins.

Abdomen: Tergites shining black, scarcely dusted, with general covering of short, decumbent black hairs. Rather weak marginal bristles present, most conspicuous on tergites 4 and 5. Syntergite 1 + 2 somewhat longer than tergite 3, with basal excavation weakly formed at the extreme base. Genitalia: Fig. 2.

Female.—Displaying strong sexual dimorphism. Frons about one-quarter head width. All femora of British specimen predominantly reddish with darker patches above towards tip (middle and hind) or more extensively above (front), relatively stouter than those of the male; trochanters and coxae partially reddish. Some continental specimens have legs predominantly black. Wings entirely smoky brown-black except for the milky-white wing tips, a pattern only otherwise found in the rhinophorid *Melanophora roralis* (L.); venation as in male. Abdomen rather dorso-ventrally flattened across tergites 1 + 2 and 3, syntergite 1 + 2 slightly reddish at sides. Terminalia rather difficult to interpret in British specimen due to distortion. John Deeming (pers. comm.) has provided the following description of what is a distinctive set of structures, based on a French and a Maltese specimen in the National Museum of Wales, Cardiff (a specimen from France has been illustrated (Fig. 3)). Sternite 5 divided into a pair of winglike structures, the ventral surface of which is covered with compact short bristles, those on the inner margin somewhat longer and forming a comb. This sternite in both shape and chaetotaxy resembles the sternite 5 of a male sarcophagine and undoubtedly serves a similar function as an adhesion plate when applied to a surface: in this case the cuticle of a bug host (in the case of a male sarcophagine, a female during copulation). The wings of sternite 5 overlay the equally heavily sclerotized and V-shaped sternite 6, the postlateral extremities of which abut the ventral (true lateral) margin of tergite 6, leaving only a hair-line membrane separating them; sternite 7 paler but well-sclerotized with a medial prominence bearing a tuft of hairs. Ovipositor black, somewhat leaf-shaped, bladelike and pointed. Leg and abdominal bristles less differentiated than in male. British specimen much smaller than the two males, body length about 2.5 mm; continental specimens up to 4.0 mm.

C. pygmaea is one of a number of insects recently discovered in Warwickshire that are either associated with southern England or the Eurasian continent. The hoverfly, *Eristalis similis* (Fallén, 1817) = *pratorum* (Meigen, 1822), first recorded in Britain in 1990 from Warwickshire, is a similar case. However, it remains unclear whether *C. pygmaea* is a recent colonist influenced by recent hot summers or a more truly endemic species associated with ruderal habitats. What is clear is that post-industrial sites in the Midlands are capable of supporting extremely rare species and unusual invertebrate assemblages, and need a much higher profile in nature conservation strategies and within the schedules of designated sites drawn up variously by local authorities, wildlife trusts and the statutory agencies.

Acknowledgements

I wish to thank Nigel Wyatt of The Natural History Museum, London, for his kind assistance in identifying the material and for placing useful literature at my disposal. John Deeming provided the detailed description of the female terminalia and placed a female specimen from the National Museum of Wales at my disposal. My colleague Steven Lane provided the list of lygaeid bugs recorded from the site and assisted me with the survey.

References

Arnaud, P. H. 1978. *Host–Parasite Catalogue of North American Tachinidae (Diptera)*. Miscellaneous Publications No. 1319. Science and Education Administration, United States Department of Agriculture.

Assis-Fonseca, E. C. M. 1949. *Dionaea aurifrons* Mg. (Dipt., Larvaevoridae) in North Devon. *Entomologist's Mon. Mag.* **85**: 19–20.
Belshaw, R. 1993. Tachinid Flies (Diptera: Tachinidae). *Handbks Ident. Br. Insects* **10 4a**(i).
Herting, B. & Dely-Draskovitz, A. 1993. Tachinidae. In: Soós, A. & Papp, L. (Eds) *Catalogue of Palaearctic Diptera Volume 13 Anthomyiidae–Tachinidae*. Hungarian Natural History Museum, Budapest.
Kugler, von J. 1977. Neue Tachinidae aus Israel (Diptera). *Stuttg. Beiträge Naturk. Serie A Nr.* **301**: 1–14.
Reinhard, H. J. 1944. New muscoid Diptera from the United States. *Jour. Kans. Ent. Soc.* **17**: 57–72.
Van Emden, F. I. 1954. Tachinidae and Calliphoridae. *Handbks Ident. Br. Insects* **10 4(a)**.

SHORT COMMUNICATION

Additional Records of British Reed Beetles (Coleoptera: Donaciinae).—Several new records have come to light since Menzies & Cox (1996) published their excellent guide to British Donaciinae. These include several records from Vice-counties not included on their maps.

Donacia bicolora Zschach. North Hampshire (VC12). Along River Slea from Kingsley (SU7837) to confluence with the River Wey near Sleaford (SU8138) and along the Wey to Surrey border, 1995–7. Also on North Branch of the River Wey from Holybourne (SU7440) to Surrey border at (SU8144), v. 1997.

D. cinerea Herbst. Ashton Keynes (SU036952), N. Wiltshire (VC7), 30.v.97; Somerford Keynes (SU026948), E. Gloucs. (VC33), 30.v.97 on *Typha*.

D. versicolorea (Brahm). Ravenstonedale Moor (NY6906) Westmorland (VC69) 16.viii.97 on *Potamogeton natans*. First spotted by my wife, Wendy.

D. vulgaris Zschach. Ashton Keynes (SU036952), N. Wiltshire (VC7), 30.v.97 on *Typha*. Smardale Gill (NY7206) Westmorland (VC69), recorded by Roger Key and John Bratton in 1993.

Plateumaris discolor (Panzer). Askham, River Lowther (NY5117). Westmorland (VC69) 29.vi.96.

P. sericea (L.) Smardale Gill, Westmorland (NY7206), recorded by Roger Key and John Bratton in 1993.

Sinclair (1997) mentions the first record of *Donacia impressa* Paykull from Kirkcudbrightshire (VC73). A pair taken in 1996 at Woodhall Loch (NX6766). He also includes a modern record for *D. thalassina* Germar from the same vice-county. These records do little to alter the trend of consolidation of the commoner species alongside a decline of the rarer taxa. The main exception to this being the healthy population of *D. bicolora* (our most dramatically declining species of all), along the River Wey catchment. I thank Dr Roger Key for allowing me to publish his records.—Jonty Denton, 26 Bow Street, Alton, Hants. GU34 1NY.

References

Menzies, I. S. & Cox, M. L. 1996. Notes on the natural history, distribution and identification of British Reed Beetles. *Br. J. Ent. Nat. Hist.*, **9**: 137–162.
Sinclair, M. 1997. A few recent Scottish records. *Coleopterist* **6**: 100.

SHORT COMMUNICATION

Two Red Data Book beetles in Surrey—On 14.v.1995, whilst beating for lepidoptera larvae at a site near Mickleham, Surrey, I dislodged from wild privet (*Ligustrum*) a beetle which was sufficiently distinctive that I decided to retain it. The beetle was passed to my father who identified it from Joy as *Cryptocephalus coryli* (L.) (Chrysomelidae) (Plate I Figs 3,4) and returned it to me without comment. It was only when I was entering details of the capture on the Recorder database that I discovered that the published status of the species was RDB1. Shirt (1987) gives records for Surrey, West Kent, Bedford., Notts., and Easterness; and indicated that the last specimen had been taken at Box Hill in 1958. In addition Hyman and Parsons (1992) give East Norfolk, Northampton, Salop and North Lincoln. Recent communication with John Owen has revealed that it has been taken at at least two sites since the Red Data Book was published. One site is in the Chilterns, the other in the Mickleham area where the species has some history. Fowler (1890) recorded it from there last century—"On young hazels in June; rare;... Mickleham, Headley Lane, Box Hill...". W. West exhibited a specimen from there at the meeting of the "South London" on 14.vi.1894, E.C. Bedwell took several there in the 1920s, and A.A. Allen took it on 8.vi.1941 and 27.vi.1943. F.D. Buck beat one from birch at Box Hill, 23.v.1948, R.J. Bartell had it in 1958, and more recently one was taken from birch there, 15.vii.1986. Privet does not seem to be mentioned as a host plant, and indeed there is no evidence that the beetle was eating it. In captivity, offered oak, hazel, birch and hawthorn, it appeared to eat only the birch. A further single example of this beetle was beaten from birch at the same site on 6.vii.1996 and between 6–20.vi.1997 no fewer than four were seen, including two females. Clearly the species is resident here but at a fairly low density and is more or less localized to one corner of a single field. One of the females has laid about one hundred eggs which are currently being reared to study the beetle's life history. Hopefully it will be possible to find wild larvae in the future.

Another uncommon beetle which has recently come my way is *Lymexylon navale* (L.) (Lymexylidae), published as RDB2. Several females were discovered at Richmond Park, 22.vii.1995, apparently ovipositing in the cut end of a sweet chestnut log (*Castanea*). This species has been recorded recently from Headley; Ashtead Common, seen most years this decade; and on several occasions from Richmond where John Owen found a swarm ovipositing on an oak (*Quercus*) log on 4.vii.1980. British breeding records of this species all relate to oak and so sweet chestnut would appear to be a new and alternative foodplant. This is not entirely surprising as a number of beetle species, such as the bark beetles *Dryocoetinus villosus* (Fab.) (Scolytidae) and *Platypus cylindrus* (Fab.) (Platypodidae), and wood-feeding moths such as *Synanthedon vespiformis* (L.) (Sesiidae), will utilize either species.

I am indebted to John Owen for information on the distribution and habits of these two species.—GRAHAM A. COLLINS, 15 Hurst Way, South Croydon, Surrey, CR2 7AP.

REFERENCES

Hyman, P.S. and Parsons, M. S. 1992. *A review of the scarce and threatened Coleoptera of Great Britain; 1.* U.K. Joint Nature Conservation Committee, Peterborough.

Fowler, W. W., 1890. *The Coleoptera of the British Islands; 4.* Reeve, London.

Joy, N. H., 1932. *A practical handbook of British beetles.* Witherby, London.

Shirt, D. B. (ed.), 1987. *British Red Data Books: 2 Insects.* Nature Conservancy Council.

A NEW PUPAL AND IMAGINAL ABERRATION OF THE MARSH FRITILLARY *EURODRYAS AURINIA* ROTT. (LEP.: NYMPHALIDAE)

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A breeding culture of *Eurodryas aurinia* was established in March 1991 by collecting a few feral post-hibernation larvae from several areas within a widespread colony in Devonshire, S. W. England. It is probable that these originated from at least three wild females. The aim of this culture was to produce successive generations for cold-shock experiments on young pupae under various regimes and to select, if possible, for post-cold-shock expression of ab. *sebaldus* Schultz phenotypes. Since the original experiments by Standfuss (1900) on *Aglais urticae* L., the author has found that moderate cold shock does not induce sterility in *E. aurinia, Argynnis paphia* L. and *Polygonia c-album* L.

Breeding technique

During the early stages, including hibernation, the young larvae were reared in tubs on growing devil's bit scabious, *Succisa pratensis*, and teasel, *Dipsacus fullonum*. The tubs were covered with fine netting to exclude parasitoids and were placed outdoors in a sunny and sheltered position. When the larvae reached the penultimate instar, they were transferred to special cages. Each cage was made from a large (55×35 cm) propagator. The roof was cut out of the translucent cover and replaced by a tightly fitting, removable lid made from fibreglass/resin. The central area of the lid was cut away and replaced with fine netting. Additional ventilation was provided by large net-covered holes in the lateral walls of the cover. The larvae were now fed on evergreen honeysuckle (*Lonicera*). Sprays of *Lonicera* were placed horizontally upon a thin layer of potting compost covering the floor of the propagator. This was kept fresh using wet 'Oasis' plastic foam wrapped in clingfilm, into which the stems were thrust. At pupation, the larvae ascended to the shady area of the lid and it was easy to remove the newly hardened pupae for cold shocks, using fine forceps. Pairings were easily obtained using hanging flight cages in sunshine inside a well-ventilated greenhouse. However, in contrast to observations on feral *aurinia*, (Thomas & Lewington, 1991), captive females refused to pair until at least 2 days old. The adults were fed on 10% honey solution. Ova were obtained by caging fertile females over growing devil's bit scabious.

Cold-shock technique

Pupae for cold shocks were collected in the early morning, around 2 pm and in the late afternoon. Only those pupae with a fully hardened cuticle were collected, usually when 8–12 hours old. The pupae from each collection were laid in an individually labelled small tray and placed on a much larger tray. This large tray was periodically inserted and withdrawn from a specially modified freezer that could be regulated to operate at ± 1°C down to -14°C. The pupae were given three 6 hour periods per day at -6°C for the first 2–3 days of the pupal stage. The pupae were then held at room temperature until eclosion.

Initial breeding results

All the wild-collected larvae pupated in May 1991. They were given cold shocks. A single aberration intermediate to ab. *sebaldus* appeared but a pairing was not obtained. However, a number of pairings amongst the type adults occurred and a number of fertile egg masses were laid. During February–April 1992, cohorts of post-hibernation larvae were successively brought into a warmed greenhouse area and quickly reared under infra-red enhanced lighting. They were reared on evergreen *Lonicera*. Many pupae developed and were given cold shocks. About 20% of the pupae produced aberrations, all within a morphocline leading to extreme ab. *sebaldus* (see Bailey, 1993, 1994). This sensitivity was confined to the first two cohorts. Succeeding cohorts exhibited a steadily decreasing percentage of aberrations. No aberrations appeared in the final cohorts in April. It would appear that larvae developing over a longer period under natural conditions acquire an increasing immunity to pattern modifications. Possibly this is due to a longer exposure to ultraviolet light (u.v.). The author has found that other species seem to acquire immunity if the larvae are reared under u.v. enhanced lighting. A female with a wing pattern intermediate to ab. *sebaldus* was paired with a normal male and the resulting F_1 stock reared in isolation. In May 1993, this particular stock was reared under natural conditions the pupae were not given cold shocks. All the F_1 adults had normal coloration and pattern (although the geometry of the wing pattern enclosing the normal colours distorts with the expression of ab. *sebaldus*). Five F_1 stock pairings were obtained, yielding in due course a large number of F_2 larvae. During February–March 1994, the post hibernation F_2 larvae were reared all together under a 12 hour photoperiod and in a 19.5°C ambient temperature and the same foodplants. All the developing larvae had normal coloration. As the pupae formed, they were given various cold-shock regimes.

Appearance of a new aberration

Towards the end of the pupations, a very young pupa, only a few minutes old, was noticed having an unusual colour, being very pale and with a slight greenish tinge. This subsequently developed into a most unusual colour form. It had a pure white background and with starkly contrasting black markings in the usual places (Plate I Fig. 4). The normal yellow markings were replaced by blackish maroon. In all, eighteen similar pupae developed. Some of these were found lying on the floor of the breeding cage and these subsequently died. After the appearance of the first aberrant pupa, no further cold shocks were performed on the remaining F_2 stock. Prior to eclosion, the aberrant pupae became extremely dark in colour and it was difficult to see the wing pattern through the pupal cuticle. The adults emerging from these aberrant pupae were quite different from the type form. There were no intermediates and both sexes were equally affected and constant in coloration. Aberrant adults only emerged from aberrant pupae, the two conditions being linked.

Description of the new aberration, ab. *atratus*.

(Plate I Figs 5–8)

The antennal flagella are black, annulate pale grey and with the clubs narrowly marked with pale grey at the tips. All the normal antennal orange is replaced with blackish maroon. The eyes are grey. The frons and labial palpi have the normal orange scales replaced by dark maroon ones. The dorsal thorax and lateral abdomen

have the normal orange scaling replaced by dark maroon hair scales. The ventral thorax and abdomen are dark grey. The legs and genitalia are blackish maroon. The male upperside fore and hindwings have all the dark pattern (the geometry being normal), replaced by smoky greyish black. The cream ground is replaced by purple buff. The orange-red ground colour is replaced by dark red ochre. The cilia are greyish buff. The male underside hindwing has the cream subterminal band replaced by smoky greenish blue. The normal orange-red ground colour in the basal area and the postmedian band is replaced by dark reddish ochre. The remaining underside cream markings are replaced by smoky buff. The underside forewings are similar but with an accentuated smoky purple hue particularly in the central area. The overall coloration is paler. All the aberrant adults were slightly smaller than normal. The post-coital deposit from a male ab. *atratus* left covering the female ostium bursae was of normal colour, as was the meconium. The name derives from *atratus* = sombre, in mourning, Latin. The original ab. *atratus* are in the author's collection.

Behaviour

The first two ab. *atratus*, both males, emerged after the usual pupal duration. All the ab. *atratus* were fairly synchronous and appeared among the slowest developers. The two males were placed in a small flight cage with several unmated type females. The males were weak and with minimal motility. Neither male would mate, therefore all subsequent *atratus* males were set. In all, six *atratus* females emerged. These were much stronger and three pairings with type F_2 stock males were obtained. From these pairings, fertile egg masses were obtained which were smaller than average. From these egg masses, a large number of larvae resulted with a minimal number of failures. The pairing females looked remarkable against the normal-coloured males (Plate I, Figs 7, 8) reminiscent of the pairing of *Argynnis paphia* f. *valezina* Esp. The *atratus* females were more sluggish than normal, hiding away under leaves in bright sunshine or resting with their wings parallel to the incident sunlight, presumably to avoid overheating.

Breeding results from the ab. *atratus* females

All the larvae from the ab. *atratus* females, called F_3, were reared *en masse* in the normal way but kept in strict isolation. On 1.ii.95, a cohort of 60 post-hibernation larvae, called f_3, was extracted and reared rapidly in warmth and u.v. enhanced lighting. By 26.ii.95, the first adults emerged. All the f_3 adults were normal. A number of pairings were obtained followed by fertile egg masses, to produce f_4 larvae. These were closely observed but no abnormalities were noted. On 25.iii.95, the first larvae commenced feeding and by 21.iv.95, the first larvae entered diapause. On 15.v.95, all the larvae were in diapause. They were placed amongst sterilized dead Beech leaves (*Fagus sylvatica*), in two separate containers, strains f4a and f4b, and held in a freezer at -2.5°C. On 15.viii.95, the first container holding f4a larvae was removed and placed amongst growing foodplant. By 19.viii.95, many larvae were feeding. From this stock, one ab. *atratus* appeared at the rate of 0.98%. However, some f4a larvae had remained in diapause and these were returned to the freezer until 15.x.95, when all the remaining larvae, being f4a and f4b, were reared as post-hibernation stock. From this stock, ab. *atratus* appeared at the rate of 11% with characters identical to the aberrants in the original 1994 F_2 stock. The reappearance of ab. *atratus* in such reduced numbers after further inbreeding suggests the action of a recessive gene(s) with a weakening effect, and with a lengthened diapause

requirement. After the October 1995 breeding programme, a few larvae remained in diapause. These were kept in a cold area until February 1996.

Returning to March 1995, the remaining F_3 larvae, from the 1994 ab. *atratus* females, were reared under natural conditions. All the adults were normal again. These were paired amongst themselves to produce a further generation, F_4, and in February–March 1996, the post-hibernation larvae were merged with the remaining diapausing larvae, f4a and f4b from October 1995. Ab. *atratus* appeared at the rate of 9%. Three *atratus* females were paired with stock from a separate Devonshire colony to invigorate the strain which was showing signs of weakening. A single pairing was obtained between a male and female ab. *atratus* but the resultant egg mass failed to hatch. Assuming the ab. *atratus* was recessive, all type adults, F_3, in May 1995 would have been heterozygous, so several males were paired with females of the Spanish race *E. aurinia beckeri* H.-S. The F_1 hybrids which were vigorous emerged in May 1996 and appeared to be intermediate between the two types but there was no trace of *atratus* characters. Presumably, *atratus* gene(s) are recessive in the Spanish race. A large number of F_2 hybrid larvae are being raised. A curious aberration appeared amongst the 1996 adults. A type female presented with streaks of *atratus* colouring in the distal compartment of the left underside hindwing. Perhaps this was due to the loss or damage to the corresponding dominant gene(s) in a primordial cell in the appropriate imaginal disc of an otherwise heterozygous specimen. Breeding stock has been obtained from this female for further research.

Conclusion

Ab. *atratus* is most probably genetic in origin and the occurrence of separate inherited aberrant characters in more than one stage of the same individual is a very rare condition in the rhopalocera. The author hopes to extend this breeding programme by hybridizing *atratus* with other races of *E. aurinia*. The origin of this genetic form is obscure. Perhaps heterozygous *atratus* was in the 1991 wild-collected larvae. If so, there would be heavy selective pressure against a homozygote ever breeding. Alternatively, perhaps a mutation was induced by cold shock after the culture was established. It would be remarkable, if proven, because the altered colours of both stages, as seen by man, and the extended diapause time would seem better suited to an alpine or boreal environment.

Acknowledgements

I would like to thank David J. Carter of The Natural History Museum for access to the National Collection and literature regarding the species, Richard Lewington for advice regarding the colours of *atratus*, Robert J. Worthy for help with livestock and Edward H. Ratcliff for the photography of the live material.

References

Bailey, K. E. J. 1993. Annual Exhibition Report 1992. *Br. J. Ent. Nat. Hist.*, **6**: 49, Plate 2 Fig. 8.

Bailey, K. E. J. 1994. Annual Exhibition Report 1993. *Br. J. Ent. Nat. Hist.*, **7**: 145–6, Plate 1 Fig. 5 (photographs of cold-shock-induced ab. *sebaldus*).

Frohawk, F. W. 1938. *Varieties of British Butterflies*. Ward Lock.

Higgins, L. G. & Riley, N. D. 1970. *A Field Guide to the Butterflies of Britain and Europe*. Collins.

Russwurm, A. D. A., 1978. *Aberrations of British Butterflies*. Classey.

1. *Yelicones vojnitsi*

2. *Conops quadrifasciatus*

3. *Cryptocephalus coryli* Male

4. *Cryptocephalus coryli* Ovipositing

5. *Eurodryas aurinia* ab. *atratus* Bailey

6. *Eurodryas aurinia* ab. *atratus* Bailey

7. *Eurodryas aurinia* ab. *atratus* Bailey

8. *Eurodryas aurinia* ab. *atratus* Bailey

Standfuss, M., 1900. Synopsis of experiments in hybridisation and temperature made with Lepidoptera up to the end of 1898. *Entomologist* **33**: 161–167.
Thomas, J. & Lewington, R. 1991. *The Butterflies of Britain and Ireland.* Dorling Kindersley.

Captions for Plate I

Fig. 1. *Yelicones vojnitsi* Papp. female. See article by Shaw, M. R. p. 15.

Fig. 2. *Conops quadrifasciatus* Deg. See short communcation by Uffen, R. W. J. p. 30.

Figs 3, 4. *Cryptocephalus coryli.*; 3. male. 4. female ovipositing. See short communication by Collins, G. A. p. 6.

Figs 5–8. *Eurodryas aurinia* ab. *atratus* Bailey; 4. pupae, ab. *atratus* to the left, 6. *E. aurinia* ab. *atratus* male. 7, 8. *E. aurinia* ab. *atratus* female in cop with typical male. See article by Bailey, K. E. J. p. 7.

LEPTARTHRUS VITRIPENNIS (MEIGEN) (DIPTERA: ASILIDAE), A ROBBER FLY NEW TO BRITAIN

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The common of Riddlesdown lies on the southern flank of a ridge of the North Downs, some twenty kilometres south of London. Here the outer tentacles of the metropolis stretch from Purley along a dry valley to Caterham. The valley is almost wholly built-up at this point where busy roads and railways pass through the suburbs of Kenley and Whyteleafe, but, high on the common above, the bustle of the valley is hidden by the brow of the hill, and at night the only lights are those of glow-worms in the grass reflecting the stars above. The illusion of countryside is enhanced by the view across to Kenley Common and neighbouring woods on the opposite side of the valley.

The common, with its favourable situation facing slightly west of south, was once a famous entomological site and many field meetings were held here, in particular to see the insects of juniper (e.g. Wakely, 1958). Following the abandonment of grazing, the growth of scrub and trees gradually suppressed the juniper and its decline was carefully monitored by Dr Lena Ward (Ward & Lakhani, 1977). As the number of juniper bushes declined, the special insects were lost. At present about five bushes remain in tiny clearings surrounded by tall trees.

Both Kenley Common and much of Riddlesdown were purchased by the City of London in the late nineteenth century and have been managed by its Corporation as public open space ever since. For many years the grassland on top of Riddlesdown was maintained by mowing, while the steep slopes, inaccessible to machinery, were abandoned to the developing woodland. However, in recent years the introduction of conservation grazing in six small paddocks, which can be closed temporarily while animals are present, has allowed many of the special flowers and insects of chalk downland to survive. It was in one of these paddocks on Riddlesdown, on 1 July 1996, that the insect forming the subject of this piece was beaten from a small birch tree. Diptera normally fly off rapidly from the beating tray, but the weather was unseasonably cool on this occasion, thus allowing the fly to be captured.

Early in the previous year, I had my first encounter with a fly with the most remarkably structured hind legs. The basal segment of its hind tarsus was enormously elongate, as long as the tibia, and flattened in the vertical plane. This proved to be a male of the robber fly *Leptarthrus brevirostris* (Meigen) and over the next two seasons I made a collection of about half-a-dozen specimens from these two commons, all from the downland slopes that are grazed outside the flowering season when insects are most active. When checking and labelling these specimens, one female stood out as being different from the others in several respects, as follows:

a) The second basal cell of the wings terminated in a point from which two veins arose, forming a cross; on the other specimens, this cell was blunt-ended, with two longitudinal veins arising separately from its end.

b) The front of the dorsal surface of the thorax (mesonotum) had short yellow hairs instead of long ones, which were white in the other females but blackish in the males.

c) The basal segment of all the tarsi was red rather than black, and the red colour on the tibiae was also more extensive.

d) The ovipositor was broader.

The aberrant specimen was accordingly submitted to Dr C. M. Drake for his opinion, but, before he could look at it, the chance purchase of a foreign work on asilids (Séguy, 1927) enabled its immediate identification as the only other species of the genus occurring in Europe, *Leptarthrus vitripennis* (Meigen). This identification was duly confirmed by Dr Drake. This discovery was announced provisionally at the Dipterists' Meeting of November, 1996, and participants were requested to check their collections of *Leptarthrus*. This led to two further British specimens of *vitripennis* being found.

The series of *brevirostris* in The Natural History Museum, London, contained about 180 specimens from Britain, and among these was a single *vitripennis*. This was taken by O. W. Richards on 20 June 1948 from chalk grassland at Box Hill in Surrey. The specimen carries the labels 'O. W. RICHARDS COLL 1967–510' and '59364'. However, this latter reference to Richards' collecting diaries yielded no further information (A. E. Stubbs, pers. comm.). My time at the museum was unfortunately limited, but a brief glance at the series of *brevirostris* from continental Europe showed that this also was a mixed series, apparently containing several *vitripennis* from Alpine regions. Sorting these out would be a worth-while exercise, since *vitripennis* was not represented under its own name.

The BENHS collection contained only *brevirostris*, as did most private collections that were searched, but yet another female specimen of *vitripennis* was discovered by Mr A. J. Halstead in his collection. This was found on a knapweed flower on 14 August 1988 at the White Downs site of special scientific interest, near Westcott, Surrey. This is another chalk grassland site, lying on the scarp face of the North Downs.

Examination of further specimens from collections has shown that some of the characters observed on my initial specimen are not valid for separating the two species (J. H. Cole, pers. comm.). The second basal cell is pointed, or almost so, on some male specimens of *brevirostris*, and so quite probably on some females as well. The hairs on the front of the mesonotum are dirty yellowish to gingery brown on other female specimens, so the white hairs on mine are probably due to bleaching. The difference in the width of the ovipositor may only be an apparent difference, since it will vary according to the amount of extension.

The remaining characters, being the short hairs at the front of the thorax and the red colour of the basal tarsal segments, give a valid separation. These characters are used in the recent key to the Asilidae of Switzerland and neighbouring countries (Weinberg & Bächli, 1995). Further differences between the species are given by these authors (and also by Séguy). The face of *brevirostris* is convex, black and shiny, while that of *vitripennis* is flat and covered by dust. Other differences apply only to males. The hind legs of male *vitripennis* are normal, lacking the compressed and extended basitarsus of *brevirostris*. The white triangles of dust in the hind corners of the tergites are absent in male *brevirostris*, which also has slightly darkened wing-tips and a black moustache, contrasting with the whitish-coloured one of male *vitripennis*.

It would appear that *vitripennis* is the rarer species of the two throughout its European range. Although Séguy gives its distribution as "all Europe", he quotes no records (but several for *brevirostris*), thus implying that it was not known from France at that time; it has apparently been found there since then, as France is listed in the Palaearctic Catalogue (Lehr, 1988). While *brevirostris* occurs in all three provinces of former Czechoslovakia, *vitripennis* is only listed for Slovakia (Chvála, 1997). Weinberg & Bächli give *brevirostris* as widespread and relatively frequent in Switzerland, while listing only four localities for *vitripennis* as well as the neighbouring countries of Austria and Germany. The Palaearctic Catalogue also

lists Greece, Poland, Rumania, Sweden and part of the former Soviet Union. There are no records for *vitripennis* from Belgium or the Netherlands, but our experience of overlooking it for at least fifty years suggests that entomologists in these countries should keep a look out for it.

While about 300 specimens of *brevirostris* have been checked and confirmed as this species, there are now three records of *vitripennis* from Britain, spanning a period of 50 years, and none have been reported in the season since dipterists were alerted to its presence here. This might suggest that *vitripennis* is a casual migrant, were it not that all three specimens came from similar habitat and all from the North Downs in Surrey, just 22 km apart. It seems more likely that the new species is an overlooked native of considerable rarity. In south-east England, *brevirostris* is also restricted to chalk grassland (Stubbs, 1970), but the difference in leg structure of the males implies that there is a difference in the biology of the two species, at least in their courtship habits. My specimen of *vitripennis* was taken towards the end of the season of *brevirostris*, as observed in the same year at the same locality. Taken with the dates of the other two specimens, this suggests that *vitripennis* might have a slightly later season, although overlapping that of *brevirostris*. This can, however, be no more than a working hypothesis at present.

My specimen from Riddlesdown has been presented to the BENHS and will be available for inspection at the Society's rooms at Dinton Pastures whenever they are open. The specimen was shown at the 1996 Exhibition of the Society, and photographed for the Exhibition Report (*Br. J. Ent. Nat. Hist.* **10**: Plate I facing p 145)

Acknowledgements

I am grateful to Dr C. M. Drake for confirming my identification, to Messrs P. J. Chandler, J. H. Cole, A. Godfrey, M. Parker and A. E. Stubbs for checking their private collections and assisting with the literature, to Mr A. J. Halstead for allowing me to publish his record, and to the Corporation of London for inviting me to survey the insects of these two magnificent sites.

References

Chvála, M. (ed.). 1997. *Check List of Diptera (Insecta) of the Czech and Slovak Republics*. Charles University Press, Prague.

Lehr, P. A. 1988. Family Asilidae. In: Soós, Á & Papp, L. (eds.). *Catalogue of Palaearctic Diptera*, vol. 5, pp. 197–326. Budapest.

Séguy, E. 1927. *Diptères (Brachycères) (Asilidae)*. Faune de France, vol. 17, Paris.

Stubbs, A. E. 1970. Observations on the oviposition of *Leptarthrus brevirostris* (Mg.) (Diptera: Asilidae). *Entomologist* **103**: 289–293.

Wakely, S. 1958. Field Meetings, 1957: Riddlesdown, Surrey. *Proc. S. Lond. Ent. Nat. Hist. Soc.* **1957**: 78–79

Ward, L. K. & Lakhani, K. H. 1977. The conservation of juniper: the fauna of food-plant island sites in southern England. *J. Appl. Ecol.* **14**: 121–135.

Weinberg, M. & Bächli, G. 1995. *Diptera Asilidae*. Insecta Helvetica, Fauna vol. 11, Geneva.

THE SURPRISING DISCOVERY OF THE GENUS *YELICONES* CAMERON (HYMENOPTERA: BRACONIDAE) IN WESTERN EUROPE

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Quicke & Kruft (1995), in the first of a series of papers by Quicke and various co-workers revising the world species of the genus *Yelicones*, briefly reviewed what is known of its biology, its diagnosis, and its somewhat tentative systematic placement within the subfamily Rogadinae. Having assembled much material on loan, they found the genus to be moderately rich in containing nearly 100 species and very widely distributed throughout the Old and New Worlds, but apparently absent from Western Europe—the very area where collecting activity has been most intensive through the centuries.

It was therefore a great surprise to me to find 9 specimens, all females, of *Yelicones vojnitsi* Papp collected in light traps by J. Blasco-Zumeta among the Braconidae resulting from his extended survey of all insects living in the Monegros region, a very arid steppe-like area of Zaragoza province in Spain that is characterized also by its gypsum soils. The specimen data are: "SPAIN; Zaragoza Prov. Los Monegros, Retuerta de Pina [near Pina de Ebro], 30T YL2794 [= UTM location], 10.viii.93, light. J. Blasco-Zumeta" (× 4), and as above but "20.vii.93" (× 2), "20.viii.93" (× 1), "30T YL2896, 8.vii.91" (× 1), and "30T YL3097, 10.vi.93" (× 1). Thus at least 3 separate trapping stations and five separate dates (in two different years) are involved, undoubtedly indicating a resident population. The research so far conducted on the insect fauna of the Monegros region has revealed a relatively high degree of endemism within Europe (over 100 species new to science having already been detected), and strong faunal links with the steppes of Central Asia, the Eastern Mediterranean, and North Africa (Blasco-Zumeta, *in litt.*).

Distribution

Y. vojnitsi was described only recently, from Tanzania (Papp, 1992), but it has subsequently been recorded from Oman, Egypt, Niger, Senegal, Kenya, Namibia and South Africa (Quicke & Chishti, 1997). The Spanish specimens were readily identified as *Y. vojnitsi* using Quicke & Shishti (1997), and I have been able to compare them with the holotype of that species, with which they agree very closely, more so than with material from Egypt treated by Quicke & Chishti (1997) with which they were also compared. The female specimens from Zaragoza have 27–29 antennal segments.

Comparison with other Braconid genera

Among genera of Braconidae known from Europe *Yelicones* can be readily recognized by the following combination of characters: inner side of eyes distinctly emarginate; all tarsal claws coarsely pectinate; fore and mid tarsi extremely shortened, especially the 2nd, 3rd and 4th tarsomeres, and telotarsus enlarged; ovipositor not or hardly exserted. In addition *Yelicones* has a distinct low and wide hypoclypeal depression, strongly rotated mandibles bearing a small

third tooth, and vein m-cu present in the hind wing. The habitus (Fig. 1) is highly distinctive, and *Y. vojnitsi* is ca. 4–5 mm in length.

Host associations

The host of *Y. vojnitsi* is unknown, but the genus is probably associated with Pyralidae (Quicke & Kruft, 1995), either largely or exclusively, and anyone having the opportunity to collect and rear larvae of this lepidopteran family in the Monegros region (where almost 100 pyralid species are known to occur; J. Blasco-Zumeta, *in litt.*) or other arid areas in Europe is strongly encouraged to do so! The host larva would be killed and mummified (possibly as a prepupa) by the parasitoid, which would pupate inside the mummy and later emerge as an adult from its caudal end.

Acknowledgements

I am most grateful to Javier Blasco-Zumeta for donating the Braconidae from his extended survey of the Monegros region to the National Museums of Scotland, to Jeno Papp for the opportunity to examine the holotype of *Yelicones vojnitsi* while it was on loan to Donald Quicke, and to the latter also for the use of the relevant key before it was published and for helpful discussions.

References

Papp, J. 1992. New braconid wasps (Hymenoptera, Braconidae) in the Hungarian Natural History Museum, 3. *Annls hist. nat. Mus. natn. hung.* **84**: 129–160.

Quicke, D. L. J. & Chishti, M. J. K. 1997. A revision of the *Yelicones* species (Hymenoptera: Braconidae: Rogadinae) from Africa and the Arabian Peninsula, with descriptions of four new species. *African Entomology* **5**: 77–91.

Quicke, D. L. J. & Kruft, R. A. 1995. Species of *Yelicones* (Hymenoptera: Braconidae: Rogadinae) in North America with descriptions of two new species. *Ann. Entomol. Soc. Am.* **86**: 129–138.

SHORT COMMUNICATION

Wanted

Records of *Thecla betulae* (L.) (Lycaenidae) in Ireland In connection with the preparation of an article on the distribution of *T. betulae* (brown hairstreak) in Ireland any records would be gratefully received and acknowledged. Please contact: Michael O'Sullivan, 20 St James Gardens, Killorglin, Co Kerry, Ireland.

AN INTERESTING FAUNA ASSOCIATED WITH WESTERN GORSE HEATH ON THE LONG MYND, SHROPSHIRE, INCLUDING A NEW COUNTY RECORD FOR *CALOMICRUS CIRCUMFUSUS* (MARSHAM) (COL.: CHRYSOMELIDAE)

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The Long Mynd (SO430940) is a large area of moorland in the Shropshire Hills, rising to 516m. It is a registered Common and intensive grazing has reduced most of the dry heath flanks to a sparse acidic grassland dominated by sheep's sorrel, etc, with low cushions of western gorse *Ulex gallii* Planchon. Many such gorse cushions were investigated for invertebrates in the course of up-dating an earlier Biological Survey (Scruby *et al*, 1985). The basic technique was: i) to lever up the lower edge of the gorse cushions using a pole, and to place the bag of a sweep net beneath; ii) the gorse was then beaten with the pole, and iii) the bag withdrawn for examination of the catch. The investigation was carried out over the period 23 July–8 August, 1996.

The ground weevils *Trachyphloeus angustisetulus* Hansen and *Strophosoma nebulosum* (Stephens) were found to be very widespread on the property, while the Nationally Scarce *Caenopsis waltoni* (Boheman) was more localized. A further Nationally Scarce weevil, *Acalles ptinoides* (Marsham), appears to show a relict distribution associated with surviving areas of heather, and the Nationally Scarce leaf beetle *Calomicrus circumfusus* (Marsham) appears to be confined to one small area of western gorse and was previously unknown in Shropshire (Hyman & Parsons, 1992). The low gorse cushions and the patches of heather are essential components of the habitat for these species, providing shelter and overwintering sites for the grassland species as well as habitat for the heath and scrub species.

The gorse cushions are also interesting for their specialist predators. These include the uncommon bugs *Myrmedobia distinguenda* Reuter (Microphysidae) and *Loricula elegantula* (Bärensprung). The uncommon spider *Crustulina guttata* (Wider) (Theridiidae) is a surprising inhabitant of the gorse litter as it is mainly associated with wetlands, but it is widespread on these slopes. Two ladybird species, *Stethorus punctillum* (Weise) and *Exochomus quadripustulatus* (L.), were also commonly present. The former is a predator of mites and is mainly known from the tree canopy (Moreton, 1969, and Eastop & Pope, 1966). The latter is a specialist feeder on scale insects (Mills 1981) and is a regular part of the gorse fauna in the south-west, although apparently more associated with conifers elsewhere.

The presence of species more usually associated with the tree canopy is one of the more striking features of this gorse heath fauna. The weevil *Strophosoma melanogrammum* (Forster) was also common in the samples, plus small numbers of *S. capitatum* (Deg.). A few trees do occur in the lower sections of the valleys which cut into the south-east flanks of the moorland, but tree cover is predominantly confined to the surrounding countryside.

The open rocky areas between the gorse cushions also provide important specialist habitat for invertebrates such as the uncommon spider *Zelotes apricorum* (L. Koch) (Gnaphosidae). One of the more remarkable species present is the robber fly *Dysmachus trigonus* (Mg.), a speciality of hot dry places and mostly known from coastal sand-dune systems or lowland sandy heaths; the survey of July 1985 found this species in large numbers, although it flew later in 1996 and only a single specimen was seen during the 1996 recording. More typical dry grassland species are also

represented and include the click beetle *Prosternon tessellatum* (L.) and the ground beetle *Microlestes maurus* (Sturm). The locally distributed grayling butterfly *Hipparchia semele* L. occurs, though apparently only in low numbers, and favours the sparsely vegetated swards, whereas another uncommon butterfly, green hairstreak *Callophrys rubi* L., breeds on the western gorse itself. Another speciality of the sparse swards is mottled grasshopper *Myrmeleotettix maculatus* (Thunberg) which attains enormous densities locally.

This very interesting fauna is dependent on moderate levels of grazing, keeping the western gorse to a low-density component of the vegetation, but is at risk from too heavy grazing reducing and even eliminating the dwarf shrub component. Evidence of this damage is very widespread and severe locally.

This fauna is intermediate between the communities characteristic of upland and lowland heath, and is probably characteristic of the dry heaths of the Palaeozoic strata of south-western Britain, particularly the flanks of the moorland blocks of Dartmoor, Exmoor, much of the Welsh Hills and the rocky seacliffs, although the latter are much more species-rich on the whole. The vegetation type mirrors this very closely, being a form of H8 *Calluna vulgaris–Ulex gallii* heath which has been so degraded by heavy grazing as to be verging on U1 *Festuca ovina–Agrostis capillaris–Rumex acetosella* grassland (Rodwell, 1991 & 1992). H8 is a western oceanic type of heath, whereas U1 is more of a south-eastern dry continental type of acid grassland.

Acknowledgements

I would like to thank David Nellist for identifying the spiders and Peter Jackson for help with understanding the National Vegetation Classification.

References

Eastop, V. F. & Pope, R. D. 1966. Notes on ecology and phenology of some British Coccinellidae. *Entomologist* **99**: 287–9.

Hyman, P. S. (revised Parsons, M.S.) 1992. *A review of the scarce and threatened Coleoptera of Great Britain.* Part 1. UK Nature Conservation: 3. Peterborough: Joint Nature Conservation Committee

Mills, N. J. 1981. Essential and alternative foods for some British Coccinellidae (Coleoptera). *Entomologist's Gaz.* **32**: 197–202.

Moreton, B. D. 1969. Beneficial insects and mites. *Bull. Minist. Agric. Fish Fd.* **20**: 1–118.

Rodwell, J. S. (Ed.). 1991. *British Plant Communities Vol.2: Mires & heaths.* CUP.

Rodwell, J. S. (Ed.). 1992. *British Plant Communities Vol.3: Grasslands & montane Communities.* CUP.

Scruby, M., Lutley, W., Alexander, K. & Clements, D. 1985. *Long Mynd, Shropshire.* National Trust Biological Survey. Unpublished report.

INDIVIDUAL SPECIES IMPACT ASSESSMENTS: A STANDARDIZED TECHNIQUE FOR DESCRIBING THE IMPACT OF DEVELOPMENT PROPOSALS ON CRITICAL INVERTEBRATE SPECIES

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Herbert Art Gallery and Museum, Jordan Well, Coventry CV1 5RW.

The British planning system furnishes several mechanisms by which important invertebrate sites can be identified and defended from development and certain other forms of damaging change of land-use. Site designation is perhaps the most fundamental of these mechanisms. It ensures that the best sites are flagged up as such at an early stage through notification as Sites of Special Scientific Interest (SSSI's) or as Non-Statutory (Second-tier) Wildlife Sites. Non-statutory sites are known variously by names such as Sites of Interest for Nature Conservation (SINC's), County Wildlife Sites, County Ecosites and so on. *Planning Policy Guidance for Nature Conservation (PPG 9)* published recently (DOE, 1994) instructs local planning authorities to identify such sites in their Development Plans (i.e. County Structure Plans, Local Plans and Unitary Development Plans—according to the type of local authority) and associated Proposals Maps, and to furnish policies that afford an appropriate degree of protection to these sites. This often suffices in dissuading developers from targeting such sites for their schemes.

However, planning applications are sometimes received for such designated sites, or for other important sites that are of sufficient quality for designation but have yet to go through the formal process of designation. Occasionally, local authorities are so desperate for inward investment opportunities that they double-designate sites both for their nature conservation importance and development potential. This is presumably with the intention of allowing the planning control system to sort out which of the two is the more important or finding a healthy compromise between the two competing interests.

Where development proposals affect internationally important sites and SSSI's, or are of a particular nature, or exceed a particular size, the production of an *Environmental Assessment* (formerly known as an Environmental Impact Assessment) is a legal requirement (English Nature, 1994). However, such Assessments, or more narrowly scoped *Environmental Appraisals*, are widely used beyond this on non-statutory sites by developers who are keen to be seen as environmentally responsible, and in areas where local planning authorities wish to treat nature conservation considerations rigorously (particularly the case where they employ in-house ecologists or work closely with their local Wildlife Trusts and statutory organizations such as English Nature).

These Assessments and Appraisals are formal processes that accompany planning applications to assist local planning authorities or DOE Planning Inspectors in reaching an informed planning decision. They usually address two issues:

- clarification or confirmation of a site's ecological importance if not already clearly established
- a prediction of the nature and magnitude of 'impact' likely to be associated with a development proposal.

Several hundred Assessments and Appraisals are produced nationally each year covering a wide variety of environmental subjects of which ecology is but one. Within the ecological part of such reports there is rarely a strict requirement for invertebrates to be considered, though this seems to be happening with greater frequency and the number of professional entomologists working as freelance consultants or as employees of large environmental consultancies is increasing. Consideration of invertebrates occurs most frequently at the site evaluation stage, when various options for the location of a development may be taking place, and at sites where the presence of unusual invertebrate assemblages is already established. Unfortunately, the quality of invertebrate information found in such Assessments and Appraisals varies greatly and can be inadequate in a number of respects:

- The adequacy of taxonomic coverage. Often only relatively popular and rapidly surveyed groups such as butterflies and dragonflies receive coverage, whilst other larger invertebrate groups with far greater potential for informing the environmental assessment process, such as flies, beetles, bugs, aculeate Hymenoptera and night-flying moths, are ignored.
- The adequacy of sampling. Fieldwork may be of insufficient regularity or duration, or data may rely entirely on archive information that is uneven in coverage and several years out of date. Fieldwork may have been undertaken at inappropriate times of the year, during poor weather, or using insufficiently skilled surveyors and inappropriate methodologies. There may be inconsistencies in approach where several different sites, or different parts of the same site, are being compared for their comparative importance.
- The quality of interpretation. There may be a lack of thoroughness in the way in which conclusions have been reached or even pure invention. There may be a lack of entomological or ecological expertise on the part of the surveyor (good entomologists are not necessarily good habitat ecologists!), or a lack of context, so that the information provided does not clearly answer fundamental questions such as 'how important is the site for invertebrates?', 'which parts of the site are most important for scarcer species and valuable assemblages?', 'what will be the scale and nature of the impact?' and 'what scope is there for ecological compensation or mitigation measures?'. Good quality information can also become distorted when it is summarized in non-technical summaries and other parts of an Environmental Assessment report (often by a different person to the one who carried out the entomological interpretation).
- The style of presentation. Poor presentation can result in difficulties in interpreting information. It commonly results from a lack of relevant detail, an excess of unnecessary detail, the use of an inappropriate format, inappropriate jargon, and again, a lack of context. The reluctance to use maps for showing the distribution of scarce or otherwise important species within a site is a particular criticism.

The consequence of these shortcomings is usually the publication of misleading statements that fail to accurately describe the importance of a site in invertebrate terms and fail to adequately describe and quantify the likely impact of a proposal. These may in turn result in over-optimistic statements that suggest that:

- The invertebrate interest of a large, diverse site can be concentrated into a much smaller area.

- The use of a vegetation-led approach (often involving the protection or translocation of vegetation types deemed most valuable by botanists) will always protect the more important invertebrate species and assemblages present at a site.
- Habitat translocation and habitat creation projects can be as successful and predictable for invertebrates as they are purported to be for plants.
- Insect populations are evenly distributed over a site and are unlikely to be affected by partial destruction of a site.

Suffice to say, such assumptions are often far from accurate. Large, varied sites tend to throw up many complex and subtle mosaics and transitions that are difficult to characterize, let alone recreate. Scarce species and unusual assemblages are often associated with vegetation types that are not considered exciting in botanical terms. Many rare phytophagous species are associated with surprisingly common plants, albeit sometimes under very specific circumstances, and sometimes these plants are very patchily distributed within a site. It is important not to over-simplify the requirements of invertebrates, whilst at the same time ensuring that important information is presented in an explicit and user-friendly format that can be readily understood by others involved in the Environmental Assessment process, such as the project manager and planning officers of the local planning authority.

Individual species impact assessments

Individual Species Impact Assessment forms (Fig. 1) were designed to provide a standardized technique that could overcome many of the problems described above. I have been influenced by my experiences as a professional local authority ecologist, an ecological consultant and a member of a wildlife trust Conservation Committee. I both vet Assessments and Appraisals and help to produce them. Individual Species Impact Assessments are double-sided sheets that can be used to demonstrate how scarce or otherwise important invertebrates might be utilizing a site and how they are likely to be impacted by a development proposal. They are designed for situations where a broad taxonomic spectrum of invertebrates is being considered and information is required specifically on the species that make a site special or unusual. A single sheet is used for each critical species. Reasonably experienced invertebrate workers should be able to produce them fairly easily following sufficiently detailed survey work.

The first page provides a map of the site showing the main habitat features and the extent of direct impact where this is only partial. Solid circles are used to show the precise location(s) at which the species was found at the site. Other symbols are then added to show the distribution of the species' habitat or other requirements. For some species, only a single symbol is required, perhaps denoting a food-plant (e.g. M for mugwort). For others with more complex biologies, several symbols might be required. A mining bee for example might require an N to show the distribution of suitable sandy nesting areas, and a variety of other symbols for the various forage plants e.g. S for sallow, B for blackthorn and H for hawthorn. The symbols are keyed out at the bottom of the page and zones of obvious potential impact can be shown with cross-hatching. On the second page, three boxes are provided to fill in information on the ecology/biology/requirements of a species, the likely impact of the development proposal and suggested mitigation measures and habitat management.

Such sheets can be produced for all the scarcer species present at a site (e.g. species classified as Red Data Book, Nationally Scarce or Regionally Scarce). This is

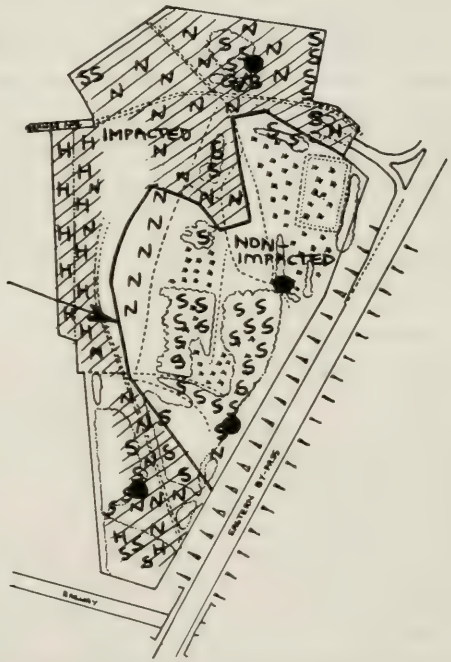
Individual Species Impact Assessment

Site:	HERALD WAY MARSH SSSI
Species:	ANDRENA TIBIALIS (A MINING BEE)
Author:	S. J. FALK

Coventry Museums & Galleries
Ecology Unit

Site Map

A moderately strong population recorded:
15/4/87
16/4/87
6/4/90
11/4/94



KEY

Species **known** occurrence at site	●

Distribution of species requirements on site (specify and symbolise accordingly)

1. SALLOW - the main forage plant	S
2. HAWTHORN – subsidiary forage plant	H
3. BROOM / GORSE " " "	B/G
4. LIKELY NESTING AREAS (sparsely vegetated sandy areas)	N
Area of likely/certain impact (substantial impact predicted)	▨

CITY OF Coventry

Fig. 1. An example of an Individual Species Impact Assessment form.

1. Brief summary of biology/ecology/requirements

A spring mining bee (typically March-May) occurring in a variety of fairly open habitats, including heathland, post-industrial sites, gardens and open woodland. Females obtain pollen from shrubs such as sallow, willow, blackthorn, cherry, maple/sycamore, hawthorn, gorse and broom. Sallow is especially favoured at this site.

Nesting occurs in sparsely-vegetated or short-cropped light soils exposed to the sun. The precise nesting areas at this site have not been identified

This is one of only 4 sites known for the bee in the vice-county of Warwickshire, and appears to be the strongest colony, with records for 4 seperate dates.

2. Likely impact of the proposed development

A substantial impact is predicted, resulting from the loss of most of the potential nesting areas; also a substantial reduction in the amount of spring-blossoming shrubs at the site. It is unclear if the bee will be able to survive following development.

3. Suggested mitigation measures and habitat management

Incorporate the planting of spring-blossoming shrubs such as sallow, willow, hawthorn (see under 1) in any screening or boundary planting proposed for the development. Attempt to create new potential nesting areas such as grassy embankments within the remaining site eg. around drainage ponds, boundary features etc.

Fig. 1 *continued.*

generally the section of the invertebrate assemblage that is of most concern as it is these species that tend to contribute towards a site's designation as a SSSI or Non-statutory Wildlife Site. On reasonably well-recorded sites this will usually amount to somewhere in the region of 10 20 Impact Sheets. If you require more than this number you are probably dealing with an exceptional locality!

Assessing impact magnitude for each species

The sheets permit the likely impact of a development proposal to be assigned to each of the species. To date I have used three levels of magnitude plus a 'don't know' category as follows:

- Minimal Impact, where 30% or less of a species habitat or any of its individual requirements are threatened.
- Substantial Impact, where 70% or more of a species habitat or any of its individual requirements are threatened.
- Moderate Impact, for a species falling between the two above categories.
- Uncertain Impact, where a species' ecology, or the status of its requirements, are insufficiently understood.

Species falling into the Substantial Impact category can be reasonably viewed as being threatened with extinction at the site should the development proceed. Those that fall into the Minimal Impact category can be viewed as having good chances of survival. For species falling into the Moderate Impact category, perhaps the best that can be stated is that one cannot always be confident that they will survive the development. The thresholds defining these categories are somewhat subjective and there is no reason why different % demarcations should not be used. However, the following points should be considered when assigning impact magnitude:

- For species with two or more requirements at a site, the loss or severe depletion of any one of those requirements could result in their extinction. Good quantities of a larval development site will be of little consequence if the adults' food source has been removed.
- The initial size of a site and the variable tolerances of different species to a reduction of their requirements will need to be considered when deciding the appropriate % figure for defining the different impact magnitude categories. For very small sites a relatively small reduction in size could result in extinction. At a very large homogenous site there may be far greater leeway.
- Some species have highly specific requirements within a vegetation type. It is not always possible to be certain which part of a marsh is suitable for a particular wetland invertebrate. It may be the entire marsh or only a tiny part of it with a particular hydrological regime or vegetation community. The entire approach has to be pragmatic, though experienced invertebrate recorders are often surprisingly good at sensing the extent of suitable habitat for a particular species, particularly where they have encountered that species on several previous occasions. Fortunately the sheets are designed so that the opinions of the recorders can be qualified using the map on the first page and the boxes on the second, and these opinions can be easily questioned and corrected in the light of new information.
- The populations of some invertebrates may be utilizing features outside the formal boundaries of the site that is being considered. They may even be operating as metapopulations at the landscape level. In the latter instance the individual

populations forming the metapopulation may become non-viable where isolation from nearby colonies occurs. It is therefore crucial to be aware of the geographical context of your site in relation to other areas of the same or complementary habitats.

- Certain forms of impact can be indirect and easily overlooked. The loss of permeable ground surface through partial development of a site may precipitate the gradual drying out of a marsh some distance away. It is always advisable to read the draft sections of other parts of the Environmental Assessment report, or to talk to other specialists involved in the project, such as hydrologists or landscape architects, before forming a final decision. Indirect impact can be accounted for in the second box of the second page ('Likely impact of the proposed development') and by adding target notes to the map.
- Site development may be piecemeal, involving small successive incursions that individually might only have a moderate impact but collectively have a substantial one.

Following assignment of impact magnitude to the more important species, one can form an opinion on whether the overall development proposal is going to have a severe, moderate or minimal impact on the invertebrate interest of the site. This can be easily arrived at by checking the number of species that fall into the different impact magnitude categories, and checking the likely fate of the rarest species.

Where only partial development of a site is proposed and flexibility exists regarding the layout, the data you have gathered may help to identify the least damaging option. The data may also help in formulating a mitigation package to reduce the impact of the actual development where it proceeds (for example through sensitive landscaping), or a compensation package such as habitat re-creation or improved management of the surviving site or another site. The information can often have far greater use than simply providing ammunition for site defence. It can provide a mechanism for obtaining some conservation gain where development is inevitable.

The end result of the process

The final report usually consists of the following:

1. The aims of the survey and methodology employed, including mention of any constraints that might have affected the quality of the data (such as poor weather, insufficient recording, physical constraints etc). Map(s) showing the layout of the proposed development and the location of the main vegetation types or other important site features.
2. Discussion of the results of the survey accompanied by a full species list arranged in taxonomic order with the scarcer species annotated with their rarity category (usually within an appendix). A clear definition of the rarity categories provided as a further appendix.
3. A table showing potential impact magnitude on the scarce or otherwise important species and a summary of these results to highlight the degree of potential impact experienced by the different rarity categories, different site compartments (where used), or different vegetation types within the site.
4. A series of Individual Species Impact Assessment Sheets providing information on the important species and the nature and severity of potential impact (as a further appendix).

5. Discussion of the relative value of the site (where known) and the potential impact of the development on the overall invertebrate fauna (scarce and common species alike), by compartment or vegetation type where possible.
6. Advice on mitigation and compensation measures that can lessen the impact of a development or produce conservation gain to offset the losses that will be incurred through the development proceeding.
7. A brief non-technical summary describing the likely overall impact and opportunities for positive measures in a few sentences or paragraphs. The style of this summary should be designed so that it can be incorporated into the general non-technical summary serving the entire report with the minimum of modification. The project manager will usually clarify what is required. Remember that any rewording of your summary by a third person could lead to a distortion or watering down of your precious and often highly precise conclusions, so keep close control on how they are used. Membership of a professional body such as the Institute of Ecology and Environmental Management (IEEM) or Institute of Environmental Assessment (IEA), which have codes of professional conduct, can be very useful in enforcing your professional or learned opinion.

How much fieldwork is required?

This will depend on the size and nature of the site, the quality and age of data already gathered, the experience and breadth of expertise of the surveyors used to carry out new survey work, and the choice of recording techniques. Both active recording techniques (e.g. netting or observation) and passive trapping techniques can be employed. Where active methods are being employed across a broad taxonomic spectrum, it is wise to sample the invertebrate fauna on at least four periods, such as spring, early summer, late summer and early autumn. However, different insect groups require different timings and in some instances a single good mid summer visit may suffice for a group e.g. dragonflies.

Often several specialists are required to provide good taxonomic coverage. For example, in most of the surveys I have co-ordinated, I will tackle Diptera, aculeate Hymenoptera and various smaller orders, whilst a colleague will concentrate on Coleoptera, Hemiptera and various smaller orders. Sometimes an arachnologist is also drafted in. Each surveyor is left to choose the ideal dates for surveying providing they fall within any deadlines. Individual visits usually consist of about 5–6 hours in the field, but this depends heavily on the size and complexity of a site. On very large sites, it is sometimes necessary to double-up visits i.e. make two visits in the place of one to ensure that a site receives even coverage.

Clearly, repeat visits by teams of surveyors can have major cost implications, but it is sometimes possible to incorporate good local amateurs onto a survey team at lower rates than professionals. Local branches of societies and recording schemes such as Butterfly Conservation often keep detailed up-to-date information on the better sites in their patch and may be able to supply instantly usable data. Occasionally budgets and deadlines are so severe that one has to be satisfied with a single visit without any additional support. Under such circumstances, it is usually wise to concentrate on finding rare and unusual species within the groups you are most comfortable with, and assessing the distribution of their requirements rather than aiming for poor species lists across a broad taxonomic spectrum. If the level of recording has been inadequate due to constraints, this should always be clearly stated

in the results and non-technical summary, otherwise lack of impact can be falsely inferred from a lack of data.

The choice of survey techniques can be critical. Trapping techniques such as pitfall traps, malaise traps and water traps can be incorporated and are very useful for groups such as beetles and spiders. They can provide a firm basis for replicable sampling, are less weather-dependent than hunting techniques and can be run over longer periods at lower expense than hunting techniques (Lott & Eyre, 1996). However, for many actively flying groups such as Diptera, aculeate Hymenoptera and butterflies, there is no substitute for some of the valuable observational data that can be gathered through netting and direct observation. This information is easily transferred to the maps using symbols and target notes. Combining active and passive techniques can be very productive as they tend to complement one another.

Gall-formers and leaf-miners are also best tackled by active searching. Rearing is rarely an option due to deadlines, but could be employed where a potential planning application is several years away. It is unlikely such work will be undertaken on a professional basis however, unless the land-owner, developer or local planning authority is exceptionally well-disposed towards nature conservation. For further advice on surveying see Brooks (1993) and Eyre (1996a).

Case histories

The above approach has now been used in 10 projects and has received favourable comment from planners, environmental consultancies, English Nature, the Environment Agency, wildlife trusts and other local authority ecologists. Two case histories are provided to demonstrate how important decisions were influenced by its usage.

1. **Herald Way Marsh SSSI, Coventry**

This post-industrial site, which was notified on the basis of its remarkable assemblage of scarce insects, was subject of a planning application by Coventry City Council, which proposed industrial development on the drier two-thirds of the site to leave a small marshy area which would be treated as a nature reserve. The first draft of the Environmental Assessment suggested that this would have minimal impact on the scarcer insects present, most of which were purported to be wetland species. Both English Nature and I (in my capacity as the council's Ecologist) were unhappy with this conclusion, suspecting a high proportion of the scarce species to be actually associated with the drier areas or dependent on both dry and wet parts of the site. I was commissioned to carry out an extensive survey during the spring and summer of 1994 and produced Individual Species Impact Sheets for 63 Red Data Book, Nationally Scarce and Regionally Scarce species. Impact magnitude was evaluated for these, which revealed that 28 would be substantially impacted and 9 would be moderately impacted (Falk & Lane, 1994). English Nature, which had been seeking a compromise prior to this, decided the partial development of the site would have an unacceptable impact on the integrity of the SSSI and decided to object outright. The City Council withdrew its application and has now agreed to work towards setting up a Local Nature Reserve here.

2. **River Cole Flood Alleviation Scheme, Warwickshire**

An Environmental Appraisal was commissioned by the Environment Agency in 1996 to examine the likely impacts of diverting a 1 km section of the River Cole to reduce the risk of serious flooding to parts of Coleshill. The river itself had some

quite interesting features such as shingle banks and slumping river banks, but the surrounding habitat was mostly improved pasture with a few wet depressions. Two full-day visits were made by a colleague and myself and special attention was given to insect assemblages associated with the river margins and the wet pasture. 376 species were recorded with individual impact sheets required for 20 scarcer ones (Falk & Lane, 1996). The shingle banks and river banks proved to be the most important features and would be severely impacted by the scheme. However, it was apparent that other shingle banks and slumping banks were present outside the zone of impact. It was recommended that the new river course should be designed to a specification that would allow new shingle banks and other useful riparian features to develop naturally in the hope that the scarce species being impacted would re-colonize these features from other stretches of the river. It was also recommended that the new river course should avoid the wet parts of the pasture and that the original river course not be completely filled in with spoil from the new stretch but developed into a linear water body that incorporated one of the original river banks and its associated plants and insects. The Environment Agency are amenable to all of these suggestions and if they are implemented it will result in considerable conservation gain to what is currently a rather dull stretch of floodplain.

Summary

Individual Species Impact Assessment Sheets are a pragmatic, explicit, flexible map-based technique for predicting the nature and severity of impact associated with a development proposal on a potentially important invertebrate site. They are designed specifically for use in Environment Assessments and Environmental Appraisals (in the formal planning sense), where a broad taxonomic spectrum of invertebrates is being considered. They are not designed for situations where a single highly endangered species is the subject of special scrutiny. Nor are they designed for 'environmental assessment' in the informal, non-planning sense, which tends to be concerned with site evaluation and comparison (using ISR Scores (Ball, 1986) and similar systems), rather than predicting impact at a single threatened site.

Their production requires the employment of sufficiently knowledgeable invertebrate specialists, but also encourages these specialists to present their information in a clear and accountable manner. Spurious data can more easily be identified and corrected, and impact can be described more easily in a non-technical fashion. This is no less than we should expect in Environmental Assessment work and the two case histories provided demonstrate that it can be a powerful tool in site defence or obtaining conservation gain. I would encourage fellow entomologists involved in Environmental Assessment and Appraisal work to test it out and I would welcome any feedback. It will also be interesting to see how the technique stands up in a planning enquiry when pitched against more traditional approaches. In theory it should be very robust if sufficient sampling was used.

The technique, which was briefly described in Falk, 1996, has received criticism by Eyre (1996b) on a number of criteria, such as its weather dependency, the lack of suitable experts nationally, cost implications and the perceived lack of enthusiasm for it by local authorities and developers in the north of Britain. Whilst I agree that these can all be constraints, they are invalid excuses for not employing it or encouraging its usage where the opportunity arises. The number of good entomologists directly involved in nature conservation is clearly growing and recent guidance by the IEA (1995), English Nature (1994) and Royal Society for the

Protection of Birds (1995) positively encourage the inclusion of broad-spectrum invertebrate surveys in Environmental Assessments. The planning system is becoming increasingly concerned with 'biodiversity' and 'sustainability' which is resulting in growing opportunities for invertebrate-related studies in site assessment and site management.

Acknowledgements

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References

Ball. S. G. 1986. Terrestrial and freshwater invertebrates with Red Data Books, Notable and habitat indicator status. Invertebrate Site Register Report 66, Nature Conservancy Council, Peterborough.

Brooks, S. J. 1993. Guidelines for invertebrate site surveys. *British Wildlife*, **4**(5): 283–286.

DOE. 1994. *Planning Policy Guidance: Nature Conservation (PPG9)*. HMSO. London.

English Nature. 1994. *Nature Conservation in Environmental Assessment*. English Nature, Peterborough.

Eyre, M. D. 1996a. *Environmental Monitoring, Surveillance and Conservation using Invertebrates*. EMS Publications.

Eyre, M. D. 1996b. Observations on Invertebrates, Monitoring, Surveillance and Conservation. In: Eyre, M. D. (ed). *Environmental Monitoring, Surveillance and Conservation using Invertebrates*. EMS Publications.

Falk, S. J. 1996. Invertebrates and Local Authorities. In: Eyre, M. D. (ed). *Environmental Monitoring, Surveillance and Conservation using Invertebrates*. EMS Publications.

Falk, S. J. & Lane, S. 1994. A study of the Scarce and Threatened Invertebrates of Herald Way Marsh SSSI with impact assessments for individual species. In: *Environmental Impact Assessment, Binley Railhead Site, Volume 3*. Exploration Associates Ltd.

Falk, S. J. & Lane, S. 1996. *A study of the insects associated with the River Cole Flood Alleviation Scheme (Phase 1 only)*. Falk Entomology (unpublished report for the Environment Agency).

Institute of Environmental Assessment (IEA). 1995. *Guidelines for Baseline Ecological Assessment*. E. & F. N. Spon.

Lott, D. A. & Eyre, M. D. 1996. Invertebrate Sampling Methods. In: Eyre, M. D. (ed). *Environmental Monitoring, Surveillance and Conservation using Invertebrates*. EMS Publications.

RSPB. 1995. *Wildlife Impact–the treatment of nature conservation in environmental assessment*. The RSPB, Sandy.

SHORT COMMUNICATIONS

Two flea beetles feeding on *Solanum crispum*.—The Chilean potato vine, *Solanum crispum* Ruiz & Pav., is widely grown in gardens as a climbing shrub for walls or pergolas. On 19.viii.97 a plant growing against the west-facing wall of a building at the Royal Horticultural Society's Garden, Wisley, Surrey was seen to be infested with adult flea beetles. They had peppered the foliage with small round holes, especially on the lower part of the plant. This form of damage is typical of adult flea beetles. Two species of flea beetle were present, *Psylliodes affinis* (Paykull) and *Epitrix pubescens* (Koch) (Coleoptera: Chrysomelidae). Both are known to feed on plants in the Solanaceae family and *P. affinis* has the common name of potato flea beetle. Fowler (1890) gives woody nightshade, *Solanum dulcamara* L. as the host plant for *E. pubescens*, with this plant and other unspecified Solanaceae for *P. affinis*. Joy (1932) gives *S. dulcamara* and black nightshade, *S. nigrum* L. for *E. pubescens* but lists no host plants for *P. affinis*, although he does refer to it as the potato flea beetle. *P. affinis* is an occasional pest of potato foliage and is of widespread occurrence.—A. J. HALSTEAD, RHS Garden, Wisley, Woking, Surrey GU23 6QB.

REFERENCES

Fowler, W. W. 1890. *The Coleoptera of the British Isles*, Volume 4. Lovell Reeve, London.
Joy, N. H. 1932. *A practical handbook of British beetles*, Volume 1. H. F. & G. Witherby, London (reprinted 1976, E. W. Classey, Faringdon).

Delayed mating in trio of *Conops quadrifasciatus* Deg. (Diptera: Conopidae) and the functional male theca.—In June 1996 I observed two male *Conops quadrifasciatus* mounted side-by-side on the back of the thorax of a female on a ragwort flower on a rural road bank at Welwyn, Hertfordshire. The flies were unusually passive and were not mating, perhaps because the sun went in and a thundery shower was imminent. I cut the flowering stem, gently stood it in the darkness of my car boot, and drove home. The flies were still undisturbed, so I took photographs. Three hours later, I noticed one of the males copulating with the female (Plate I, Fig. 2).

The photograph clearly shows that the male clasps the apex of the female's abdomen between his small theca and his genitalia. The female's much larger theca, used to clasp a host when ovipositing, is not involved. British keys to *Conops* are confusing to the beginner because they fail to mention the existence of a male theca and how to tell the sexes apart, and figure only female abdomens.

In both sexes the thecal swelling is beneath segment 5. In the female tergites 6 and 7 are clearly articulated, whilst the male has but one bulbous sclerite, though there may be a basal setose zone and a sharply defined apical zone of different surface vestiture. In both sexes there follows an incurved structure bearing the anus on its outer surface. The male genitalia or female ovipositor are entirely concealed beneath this terminal structure.—R. W. J. UFFEN, 4 Mardley Avenue, Welwyn, Herts AL6 0UD.

THE 1996 PRESIDENTIAL ADDRESS—PART 2 THE BIOLOGY OF PLUME-MOTHS

COLIN HART

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In recent years the Presidential Address has covered a number of topics. Last year Malcolm Scoble concentrated on the relationship between societies and museums, providing thought-provoking ideas on the future direction of the Society. In the previous year Paul Waring gave us a thorough review of the Society's field meetings highlighting the depth of field knowledge held in the membership. Other recent Presidents have covered conservation issues, light traps and site-specific surveys. For my address I would like to return to one of the original aims of the Society and speak simply about a group of insects. I first became interested in the Plume-moths about twelve years ago in order to give a talk to the Amateur Entomologists' Society. I settled on the Plume-moths as a topic because little modern information had been published on this group, and consequently many entomologists knew very little about them. As many members will know, when you start to study a subject in detail, finding the answer to one question reveals ten more waiting to be answered. Thus is the entomologist hooked!

The Irish plume (*Platyptilia tesseradactyla* (L.)) is not a familiar insect to most British entomologists as it is only known from Ireland. It was first discovered at Clonbrock in the east of County Galway in June 1895. However, the stronghold of this insect has always been the Burren region of County Clare where it is widespread in grassy areas with rocky outcrops. The Irish plume is not restricted to the Burren, for there are scattered records from neighbouring Irish counties and several colonies exist nearly two hundred miles away on mountain tops near the town of Pomeroy, County Tyrone, in Northern Ireland. These were discovered by Thomas Greer in 1935 and as far as I can discover they have not been looked for since.

The larva feeds on mountain everlasting (*Antennaria dioica* (L.)), which is a member of the Compositae and related to cudweed (*Filago vulgaris* Lam.). Mountain everlasting forms small untidy clumps of leaves from which cream or pink, rather fluffy flowers arise. It is a common plant in northern England and Scotland, but is small and easily overlooked, and it is possible that the Irish plume may yet be discovered in a sheltered spot on the west coast of Great Britain.

The dull yellow eggs are laid on the flowers in June, and are pushed a couple of millimetres into the mass of hairs that surround the florets. The egg hatches in about a fortnight and the young larva feeds out of sight on the developing seeds. After two or three weeks the small larva enters the flower stem and makes its way down to the leaves at ground level. Here it burrows into a bud and excavates a small cavity where it remains for the rest of the summer, entering hibernation in October. At this stage there is no outward sign that the larva is present in the plant. In early spring it resumes feeding, eating out the contents of the central bud but leaving a shell of undamaged leaves and moving on to a fresh bud at night. Occasionally, black frass spills from the infected bud, but usually there is very little trace of the larva.

Fully-grown the larva is 7–9 mm long, cigar-shaped, with a small black head and prothoracic plate. The body has a dull red ground colour with irregular dirty white patches, and is well camouflaged amongst the developing flower buds (Fig. 1). By early to mid May the larva is ready to pupate. The site chosen is normally a non-flowering rosette with a bud that is just opening. The centre of the bud is eaten out

but the outer pair of leaves are held together internally with silk leaving a small natural opening at the top 2–3 mm across.

The rather angular pupa is black or dark olive marked with white; in shape it resembles the pupa of the common coltsfoot plume (*Platyptilia gonodactyla* [D. & S.]). The pupa rests upright inside the hollow bud and the adult insect emerges through the hole to expand its wings. Occupied buds have a slightly different appearance to healthy buds; the leaves are paler, less shiny and may start to wilt. With practice and hard work it is possible to find full-grown larvae and pupae during the second half of May.

The moth is widespread in the Burren and plants on open, rather wet ground between rock outcrops are the most productive. The moth is a startlingly pretty creature of brown and white, and like all plumes it repays handsomely the act of rearing from the early stages. A female moth, feeding on a flower of mountain everlasting, is shown in Fig. 2.

The pretty little saxifrage plume (*Stenoptilia millieridactyla* (Bruand) (= *saxifragae* Fletch.)) has a very interesting history in these islands. It was first noticed in the suburbs of Dublin in about 1940, where it was found to be common and widely distributed in suburban gardens. The larva feeds on mossy saxifrage (*Saxifraga hypnoides* L.) which is a popular garden rockery plant. At the time the origin of this population was a mystery. But, in 1962 it was discovered in the south of the Burren at Moheramoylan and since then has been found to be widely distributed in this region. It seems likely that the moth was introduced to Dublin gardens on plants of saxifrage collected from the Burren. In 1969 Tony Harman caught a specimen of the saxifrage plume in his garden trap in Chesterfield, Derbyshire. Once he had identified the moth he remembered that his next door neighbour, who was Irish, had been on holiday to Dublin in the previous year. On talking to her he gathered that she had brought back some rockery plants and planted them in her garden. This account appears to date the introduction of this moth into the United Kingdom. Since that time it has spread widely into six counties in the midlands and north of England. In 1984 a lone specimen was reported from Scotland when an adult was attracted to a shop light in Paisley, and in May 1996 I discovered it in two more vice-counties close to the suburbs of Glasgow. In almost every record from the UK the moth has been found on rockeries in suburban gardens. It appears to thrive in this habitat, but does not seem to spread into the wider environment.

The egg is laid on the edge of a saxifrage leaf, usually on one of the pointed lobes, in June or July. After hatching the young larva makes a small insignificant mine in the leaf, and gradually makes its way towards the leaf base. It hibernates whilst still small in the thick base of a leaf or in a bud. In April it starts to feed externally on the spring growth of leaves and moves on to the buds and flowers as these appear. Some larvae make rapid progress and are full grown by the time the saxifrage flowers are in bloom. Later larvae feed on the developing seeds by making a hole in the side of the seed case and clearing out the contents. On the Burren it occurs in almost every microhabitat in which the saxifrage is found, but the most productive is a natural rockery at the foot of a cliff. The larva prefers to eat the petals and immature seeds, and a sure sign of its presence on a patch of flowering saxifrage is severe damage to a number of flowers. Looking for larvae on the flowers in May and June is probably the easiest way to record this species (Fig. 3).

The larva, like most plumes, is cigar-shaped. The colour is usually pale green with a broad white lateral line, but the ground colour can vary from white through green to dark red. The larva generally matches the colour of the part of the plant on which it is feeding. The pupa is normally green or reddish. Fig. 4 shows a plant in drought

Plate II. PLUME MOTHS

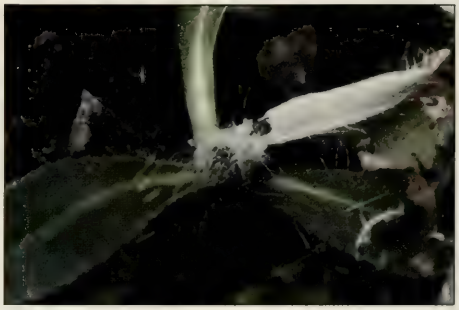
1. *Platyptilia tesseradactyla* Larva

2. *Platyptilia tesseradactyla* Adult female

3. *Stenoptilia millieridactyla* Larva

4. *Stenoptilia millieridactyla* Pupa

5. *Oxyptilus parvidactyla* Eggs



6. *Oxyptilus parvidactyla* Pupa

7. *Oxyptilus parvidactyla* Adult

8. *Pselnophorus heterodactyla* Larva

Plate III. PLUME MOTHS

9. *Pselnophorus heterodactyla* Pupa

10. *Merrifieldia tridactyla* Larva

11. *Merrifieldia tridactyla* Pupa

12. *Merrifieldia leucodactyla* Adult male

13. *Merrifieldia tridactyla* Adult male

14. *Amblyptilia acanthadactyla* Pupa

15. *Amblyptilia acanthadactyla* Adult

16. *Amblyptilia punctidactyla* Adult

conditions which has turned reddish, together with a pupa which mimics one of the bracts. The pupa may be found on any part of the plant; it can be tucked down amongst the leaves in the rosette or suspended high up amongst the flowers.

The moth can be disturbed at any time of the day but becomes more active in the afternoon and after dark. The adults are hard to photograph because they twist their wings forwards as they settle. There are persistent reports of a partial second brood in September which I think are incorrect. The young larvae come out of hibernation over a long period in the spring, which means larvae of all sizes can be found in the summer. The resultant moths emerge throughout June, July and into August, the latest ones making it into September. I have bred and overwintered this species several times and I have never experienced an autumnal emergence.

A common, but much overlooked species is the small plume (*Oxyptilus parvidactyla* (Haworth)) which is found on chalk and limestone downland over much of England and in suitable habitats in Wales and Scotland. This is a small, retiring plume which is associated with mouse-ear hawkweed (*Hieracium pilosella* L.) on short to medium length turf. Whilst rearing this moth I was surprised to find that the large yellow eggs are laid not on the leaves but on the long silky hairs which are found on both sides of the leaf (Fig. 5). This gives them a superficial resemblance to the eggs of lacewings (Neuroptera, Chrysopidae), and probably serves to protect them from foraging ants and other predators. The eggs are laid in July and hatch in about a fortnight. The larva feeds in the central rosette of the hawkweed and makes very little progress in its first year. Hibernation also occurs in the rosette and there is little trace of the larva at this stage. In April the larva starts feeding in earnest; it eats out the heart of the central bud and moves on to a fresh plant six to eight times before becoming full-grown. The presence of a full-grown larva or pupa in a rosette is easy to see as the disintegrating bud is covered with silk, leaf hairs and black frass (Fig. 6).

The larva is a small white grub seven to eight mm long, with a broad grey dorsal stripe. The pupa has dark patterned wing cases and thorax, and the abdomen is pale brownish-orange. The adults are shy, hiding low down amongst grass for most of the day, although they sometimes fly and can then be netted. At dusk they crawl up the grass stems and fly low over the turf. With their small size and dark coloration they resemble mosquitoes and are very difficult to follow on the wing. Even when settled the adults (Fig. 7) are nervous and easily take flight. This insect is not easy to find in any of its stages, despite the obvious damage caused by the larva. Because of this it is certainly under-recorded and it probably occurs on most downland and limestone habitats with a good growth of mouse-ear hawkweed. I have several times come across the moth by accident on grassy downland. I find the most productive method is to sweep for the adults at dusk (between about 9:00 and 10:00 pm BST in the south of England), from mid-June to mid-July. The female moth has a smaller wingspan and a stouter abdomen than the male and will normally lay a number of eggs if netted on a pot of growing Hawkweed left in a warm spot in the garden. The larvae are not difficult to overwinter if given plenty of food.

The short-winged plume (*Pselnophorus heterodactyla* (Müller)) is rightly regarded as rare. It has long been known from several sites in the Cotswolds but in recent years it has survived only in Cranham Wood, near Stroud in Gloucestershire. Here it became very scarce in the late 1930s after a drought and was apparently not seen for nearly 20 years. Since 1961 the moth has become much commoner and larvae have been found over a wide area within the wood. Old records exist from Glen Tilt near Blair Atholl in the Scottish highlands, another near Carlisle and finally one for Herringfleet, near Lowestoft. This anomalous distribution is hard to understand

especially since all these records are over forty years old and some date from the nineteenth century. In 1990 Keith Bland cast some welcome light on these records when he reported the discovery of this moth at two sites in Scotland. One was a rediscovery at the old Falls of Fender site near Blair Atholl and the other a new site called Keltney Burn, near Aberfeldy.

In Gloucestershire the larva feeds on wall lettuce (*Mycelis muralis* (L.)), 'windowing' the leaves as a tiny larva in the summer. It hibernates when about a quarter grown in leaf litter around the base of the plant. Breaking diapause must be delayed as the foodplant is herbaceous and the larva must wait for the spring growth since it feeds on the leaves. In the spring the larva eats part way through a young stem, two or three leaves from the top, which causes the top part to wilt. The larva then rests along the wilting leaves for two or three days, eating some of the leaves before repeating the process with a new stem. This method of feeding in the mature larva is unusual in Lepidoptera but is shared by a number of other plume species.

The larva is off-white in colour, with a greyish or yellowish tint. It is hairy with long, sparse white hairs. If placed on a leaf the larva is very obvious (Fig. 8), but on a stem of wall lettuce and silhouetted against bright foliage the hairs match the plant hairs closely and the larva is quite hard to spot. The newly hatched larva is a tiny creature with a number of hairs as long as the body: they cause the larva some inconvenience in moving and when disturbed the larva curls up into a ball and may be supported on the hairs. The pupa is normally found low down on the plant attached to the main stem and is similar to the larva but with variable dark markings on the dorsum and thorax (Fig. 9). In Perthshire larvae were found on marsh hawks-beard (*Crepis paludosa* (L.)). The adult has chocolate brown wings with cream-coloured tufts on the forewings.

I have found the moths easy to breed: they will pair and lay their tiny eggs if simply left in a plastic box with the foodplant. The larvae are easy to rear and overwinter on potted wall lettuce. A good handful of dead oak or beech leaves placed in the pot in October will give the larvae plenty of hibernating sites.

The thyme plume (*Merrifieldia leucodactyla* ([D. & S.]) (*tridactyla*)) is the common plume moth which feeds on thyme and is found in lime-rich habitats all over Britain. I have even found it at 600 m (1950 feet) on Meikle Elrick, near Braemar, and it is well distributed in Scotland. My main reason for showing you this species is to point out the differences from the next.

The burren plume (*Merrifieldia tridactyla* (L.) (*fuscolimbatus* Dup.) (*icterodactylus* Mann)) is a much less common species. It was first discovered in the Burren of Ireland in July 1952 and subsequently on the Lizard peninsular in Cornwall in July 1965. It should be noted that in the latest revision of nomenclature (Gielis, 1996) the specific name *tridactyla* has passed from the first species to the second. The two species are difficult to separate in the field although differences in the flight have been described (Huggins, 1955). In Ireland the two species fly together and it is often hard to know with which species you are dealing. In Cornwall, however, only *tridactyla* is known to occur. One of the sites is not far from Lizard Point and larvae seem to occur only on patches of thyme growing over bare rock. Drought conditions cause the thyme leaves to darken and become purplish in colour, sometimes almost black. The larvae remain bright green so in these conditions they can become very obvious as they rest on the plant.

The larva has a wide, dark dorsal band and although this varies in shade and intensity it serves to distinguish this species from *leucodactyla* in most cases (Fig. 10). The larva is similar in size and colour to the thyme leaves and the larval hairs resemble those found on the leaves. In colour and shape the pupa is similar to the

larva, and is often found attached to a bare stem of thyme or the underside of a leaf (Fig. 11). Pupae are not so hard to find as one might think. As thyme often forms a sheet of foliage over the rock, the underside can be examined by lifting up the plant and folding it gently back, sometimes revealing a pupa attached to one of the stems.

Although the adults of these two species are very similar there are two external features which, with the help of a hand lens, can be used to separate them. The first is the pattern of scaling on the antennae. Both species have a mixture of black and buff scales. In *tridactyla* the mixture of scales is random, but in *leucodactyla* the scales are formed roughly into stripes, two light and one dark, which run dorsally along the length of the antenna. Secondly, there are differences in the wings. On the second forewing lobe, the anterior fringe hairs (in the wing cleft) are dark in *leucodactyla*. In *tridactyla* the hairs are dark but pale basally and suffused with pale scales; this character is clearer in males than in females (Fig. 12, *leucodactyla* and 13, *tridactyla*). The wings are subject to some variation so this last character cannot be used for all individuals.

I have two reasons for showing the beautiful plume (*Amblyptilia acanthadactyla*. (Hübn.)). The first is to point out the differences between this species and the very similar dark-brindled plume (*Amblyptilia punctidactyla* (Haworth)) and the second is to comment on its abundance and foodplants.

The larva of the beautiful plume can be found feeding on the flowers of cross-leaved heath (*Erica tetralix* L.) in many boggy localities throughout Britain. It is usually green with pale dorsal and sub-dorsal stripes. The pupa is attached by the cremaster only, usually to a stem of the foodplant. In colour the pupa varies from brown through olive to whitish-green. It has two dark diagonal lines which pass through the wing and body; one line is extended into paired paddle-shaped processes on the dorsum which give it a most unusual shape. The processes break up the outline of the pupa but the points can be shiny and may also mimic the glands found on the stems of *Erica* (Fig. 14). The adult moth is striking with pointed wings and strong markings. For identification, notice that the wing has a brownish-red tinge and is relatively narrow. There is a pale subterminal line which runs parallel to the termen; as this line meets the costa, the wing on one side of the line is darker than on the other (Fig. 15). By comparison, the dark-brindled plume has blackish wings with a dark green cast and the wing is relatively broad. The subterminal line turns in towards the body slightly as it meets the costa, and at this point the wing is the same colour on both sides of the line (Fig. 16).

At the turn of the century Tutt collected larvae from hedge woundwort (*Stachys sylvatica* L.) in south Devon from which 450 *acanthadactyla* and 21 *punctidactyla* emerged, a ratio of 22:1. On another occasion he talks about a 200:1 ratio between these two species in favour of *acanthadactyla*. Bankes collected 'hundreds of larvae' in an area known to harbour *punctidactyla* but had 'no success' with breeding this species out (Tutt, 1906).

This is at odds with my own experience. I have searched *Stachys* in many counties over the last ten years and I have always found only *punctidactyla*. I did eventually find *acanthadactyla* but it was on bogs and mosses and the foodplant was *Erica*. Now, I can't believe that the old entomologists were wrong. I can only believe that in the early part of this century *acanthadactyla* was common and fed on *Stachys* and other plants, and that now it is a much rarer moth feeding mainly on *Erica*. This started to change in 1994 when Mark Parsons caught a specimen in Richmond Park. In 1996 Phil Sterling found a small colony of *acanthadactyla* in his garden in Weymouth and found larvae feeding on lemon balm flowers. In the same year I had a phone call from Janet Beeching of Ham Street in Kent and was told of another

colony apparently living on a garden heather bed. At the AES exhibition that year I had yet another 'town' record, this time from S. J. Edwards of Burnham, near Slough, again on garden *Erica*. It appears to me that *acanthadactyla* has in the last few years managed to change its habits and adapts to living in gardens, feeding on a wider range of plants. If this is the case then it is similar to the Saxifrage Plume which also seems to have adapted to living in gardens.

Conclusion

I've spoken today about some obscure moths, about rare and local species and separating some difficult pairs. I want to conclude not with problems but with the pleasures of studying the plumes. Most of the plumes are locally common, widespread, and easy to identify. Of the 34 or so species in the UK, only four pairs of species and one group of three are difficult to separate. With their long, delicate wings they are easily damaged and they are best studied by searching for the early stages, and rearing them through. Some species are easy to breed and to keep going for several years and some will establish themselves in a suitable garden with a little encouragement. Most are subject to the cyclic changes in abundance which affect many of our insects, so the apparent loss of a species from a site should be checked a year or two later. Although most of the plumes do come to light, their study will be better rewarded through traditional methods of field entomology. The skills and pleasure involved in finding a well-camouflaged larva or cryptic pupa are more rewarding than a score of species records at m.v. light. For my last word I sometimes think that field entomology for me is nothing but an excuse to get out into the fresh air and experience the scents, the sights and the sounds of the countryside.

References

Agassiz, D. J. L. 1994. Microlepidoptera Review of 1992. *Entomologist's Rec. J. Var.* **106**: 213.

Beirne, B. P. 1954. *British pyralid and plume moths*. Frederick Warne and Co. Ltd. 207 pp.

Beirne, B. P. 1950. *Stenoptilia saxifragae* Fletcher, in Ireland. *Entomologist's Rec. J. Var.* **52**: 61–2.

Beirne, B. P. 1951. The life history of *Stenoptilia saxifragae* Fletcher. *Entomologist's Rec. J. Var.* **53**: 85–6.

Bradley, J. D. 1953. Microlepidoptera collected in the Burren, Co. Clare, Ireland, in 1952, including a plume moth new to the British list. *Entomologist's Gazette* **4**: 135–140.

Fletcher, T. B. 1950. A new Irish Plume-moth (Lep., Alucit.). *Entomologist's Rec. J. Var.* **52**: 25–9.

Gielis, C. 1996. Pterophoridae. In: Huemer, P., Karsholt, O., and Lyneborg, L. (eds) *Microlepidoptera of Europe* vol. 1: 25.

Greer, T. 1936. *Platyptilia tesseradactyla* L. in County Tyrone. *Entomologist* **70**: 222.

Harman, T. W. 1971. The End of a Decade. *Entomologist's Rec. J. Var.* **83**: 178.

Huggins, H. C., 1955. The Irish sub-species of *Alucita icterodactyla* Mann (Lep: Pterophoridae). *Entomologist's Gazette* **6**: 124–126.

Jobe, J. B. 1984. *Stenoptilia saxifragae* in North Yorkshire. *Entomologist's Gazette* **35**: 256.

Newton, J. 1985. *Supplement to Clutterbuck and Bainbrigge-Fletcher's microlepidoptera of Gloucestershire*. 29 pp, Gloucestershire Naturalist.

Tutt, J. W. 1906. *A natural history of the British lepidoptera*, **V**, 558 pp, 4 pls. Swan Sonnenschein & Co., London.

OFFICERS' REPORTS FOR 1997

Council's Report

This year has seen the Society's membership increase to over 800, and by the end of the year there were 814 members. Seventy-three new members joined the Society during the year, five members resigned and nine were struck-off for non-payment of subscriptions. At the end of the year six members completed 50 years' continuous membership of the Society and were elected Special Life Members. There are now 25 individuals who have been members for 50 years or more. It is surely a healthy sign that the Society can retain the interest of members over many years. Alas, the years also take their toll of our membership and we regret to have to record that six deaths were reported to the Society during the year.

The Council met seven times during the year and, on average, fifteen members attended each meeting. No major problems had to be dealt with during the year. A major innovation has been the setting-up of the Society's Research Fund. This will enable small grants to be given to aid studies resulting in the production of identification guides and distribution lists, and to assist field work, with particular emphasis on conservation. Four awards were made in 1997 amounting to a total of £1200. These are described in more detail in the Research Fund report. A proposal to have a second fund to aid the publication of entomological work has been put in abeyance until the success of the Research Fund can be judged. For the time being requests to help finance publications will be dealt with, by the Council, when they are received. The Society is pleased to have been able to help with a grant to aid the publication of the *Larger Moths of Surrey* by the Surrey Wildlife Trust. At the end of the year the Society answered a call for assistance, with a one-off grant to the *Entomologist's Record*, a not-for-profit journal, which had found itself in financial difficulty.

The Society's Conservation Working Group (CWG), led by Stephen Miles, continues to advise the Council on conservation matters and to develop the Society's contribution to insect conservation. An invertebrate conservation day for Trust members and the general public was held at a Hampshire Wildlife Trust reserve in June and was well attended. A similar event is planned at the Royal Society for the Protection of Birds Minsmere reserve in 1998. Field meetings have been held at a National Nature Reserve and a National Trust property to provide species lists and identify the entomological value of the sites. The CWG has also continued to provide advice to Wokingham District Council on the management of Dinton Pastures Country Park.

One little-publicized activity is the provision of information on insects and other invertebrates to the general public and the press. The Society, through its Honorary Secretary, receives from three to four telephone enquiries a week from non-members on such matters, and up to seven have been received in one day this year. It is usually possible to satisfy most enquirers, who generally seem to have exhausted most other sources of information before coming to the Society. It seems that some publicly funded bodies are now unwilling or unable to provide this service. The Society has set up a Web site on the Internet, giving information about the Society and its activities, and its pages are regularly accessed.

Ian McLean arranged ten indoor meetings in the rooms of the Royal Entomological Society and nine workshop meetings at the Pelham-Clinton Building. Attendance at the indoor meetings has again fallen, with around nineteen people at each meeting. The workshop meetings remain very popular with, on average, fifteen people present at each workshop. The Society's collections and library were open to

members on sixteen occasions during the year and have attracted members from as far afield as Northamptonshire, Somerset and Warwickshire. We would like to thank Peter Chandler for opening and manning the building on almost all these occasions.

Twenty-two field meetings were arranged by Paul Waring and were spread over a variety of habitats and localities in England and Wales. Seven of these meetings were held jointly with other societies. Six members took part in a second expedition to Belize, led by Dr Waring. Travel costs within Belize were funded by the Society; all other costs were met by the participants. One gratifying outcome of these expeditions is that local interest is being maintained after the expedition has left, and samples have been sent to Dr Waring from Belize. Because of the large number of applications from members for the second expedition, a third expedition is being organized for 1998 and the Society will again contribute towards the cost.

Another successful Annual Exhibition was held in October and, although the Lepidoptera predominated as usual, there was a good spread of exhibits from other orders. Attendance appeared to be down on last year and this was confirmed by the numbers signing the attendance book, 174 members and 66 visitors. The Annual Dinner was again an enjoyable occasion and there was a small increase in the number attending. Michael Simmons is to be congratulated for his excellent organization of these two annual events. The Council is aware of some members' dissatisfaction with the Imperial College venue for the exhibition. This seems to centre on the difficulty of parking, and the high charges levied for parking in the College grounds while attending an event in the College, and one for which the College has been paid. The Council also feels that savings, on the cost of the exhibition and dinner, could be made by moving elsewhere and this possibility is being pursued for 1999. The Council considers, however, that a central London location is necessary for the convenience of the greatest number of members, in which case parking is likely to remain a problem. We would welcome members' comments on the exhibition venue.

During the year sales of the Society's books, journals and Christmas cards have continued steadily under the management of Gavin Boyd, the Sales Secretary. Mr Boyd has calculated that all our titles will be out of print by, or soon after, the year 2000. Two new titles, one on the Larger Brachycera by Alan Stubbs and the other on the British Plume Moths by Colin Hart, are in preparation and should be published in 1998.

JOHN MUGGLETON

TREASURER'S REPORT

The Statement of Financial Activities for the year discloses a net movement of funds out of the Society for the first time in many years. We have finished the year with £2700 less than when we began it. This is after taking into account unrealised investment gains of nearly £3700. We have therefore spent some £6300 more than we received in the year. It may seem odd for a treasurer to say, but I am very pleased to report this deficit, as it is the result of directly furthering the charitable aims of the Society.

Direct charitable expenditure totalled £30,200 and management costs were only a little more than ten per cent at £3300. Our income was £30,300 less trading costs of £3000 without the benefits of bequests or the introduction of assets as we had last year.

It seems to me that the finances of a Learned Society such as this should be managed so as to maintain long-term stability while applying current funds to the objects of the Society, in our case the promotion and advance of entomology. Although Council must always hold in mind future generations of entomologists who may join this Society, we must not forget the needs and aspirations of our

current membership. Indeed the members of Council, as trustees, are specifically charged with a duty to do that under the Charities Acts.

In trying to achieve this balance Council has set aside £78,000 of investments to grow in our Housing Fund with a view to eventual replacement of our premises at Dinton Pastures. The lease has over sixty years to run but it is important not to get left behind. We have invested a further £30,000 in the new Grant Fund to provide money to assist our members and others with entomological research and we hold £54,000 in the Special Publications Fund, much of which is earmarked for financing forthcoming titles over the next year.

In total the Society's funds exceed £445,000 and I feel confident that the Society remains in a strong financial position, well able to finance its expanding activities and to meet future demands.

Once again I extend my thanks on behalf of the Society to our members Denis O'Keeffe and Reg Bell who have audited our accounts.

Independent examiners' report

We report on the accounts of the Society for the year ended 31 December 1997, which are set out as follows.

Respective responsibilities of trustees and examiners

As the Charity's Trustees you are responsible for the preparation of the accounts; you consider that the audit requirement of Section 43 (2) of the Charities Act 1993 does not apply. It is our responsibility to state, on the basis of procedures specified in the General Directions given by the Charity Commissioners under Section 43(7)(b) of the Act, whether particular matters have come to our attention.

Basis of independent examiners' report

Our examination was carried out in accordance with the General Directions given by the Charity Commissioners. An examination includes a review of the accounting records kept by the Charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and seeking explanations from you as Trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit, and consequently we do not express an audit opinion on the view given by the accounts.

Independent examiners' statement

In connection with our examination, no matter has come to our attention:

(1) which gives us reasonable cause to believe that in any material respects the requirements (a) to keep accounting records in accordance with Section 41 of the Act; and (b) to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the Act, have not been met; or

(2) to which, in our opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

D. O'Keeffe and R. A. Bell

Statement of Financial Activities
for the year ended 31 December 1997

Incoming resources		Unrestricted funds	Restricted funds	Endowment funds	Total funds 31.12.97	Total funds 31.12.96
Subscriptions		10410	–	–	10410	10123
Investment income		6493	6144	772	13409	12503
Bequests & donations		–	–	–	–	12203
Trading income	note 2	1104	5419	–	6523	11429
Sundry income	note 3	–	–	–	–	40604
Total incoming resources		18007	11563	772	30342	86862
Resources expended						
Direct charitable expenditure:						
Cost of journal		9289	–	–	9289	9417
Cost of facility at Dinton Pastures		–	3693	–	3693	5265
Members' meetings & exhibitions		3789	–	–	3789	1937
Library & curation		693	–	–	693	1580
Grants	note 10	5350	–	770	6120	610
Depreciation		4419	2210	–	6629	7019
		23540	5903	770	30213	25828
Other expenditure:						
Management costs		3357	–	–	3357	5382
Trading costs	note 2	500	2662	–	3162	6447
		3857	2662	–	6519	11829
Total resources expended		27397	8565	770	36732	37657
Net resources before transfers		(9390)	2998	2	(6390)	49205
Transfers between funds		–	–	–	–	–
Net incoming/(outgoing) resources		(9390)	2998	2	(6390)	49205
Gains & losses on investment assets						
Realized		–	–	–	–	–
Unrealized		1777	1681	211	3669	3518
Net movement in funds		(7613)	4679	213	(2721)	52723
Fund balances brought forward at 1 January 1997		163263	270853	14174	448290	395567
Fund balances carried forward at 31 December 1997		155650	275532	14387	445569	448290

Summary Income and Expenditure Account

	1997 £	1996 £
Gross income of continuing operations	30342	86862
Total expenditure of continuing operations	36732	37657
Net income/(outgoings) for the year	(6390)	49205

Balance Sheet as at 31 December 1997

	Notes	1997 £	1997 £	1996 £	1996 £
Fixed assets					
Tangible assets	4		183386		189156
Investments	5		219270		215601
			402656		404757
Current assets					
Stocks		10525		12441	
Debtors	6	6673		4119	
Cash at Bank and in hand	7	32356		31062	
		49554		47622	
Creditors: amounts falling due within one year	8	6641		4089	
Net current assets			42913		43533
Net assets			445569		448290
Funds	9				
Endowment funds—Hering Fund			14387		14174
Restricted funds—Housing Fund		221735		218891	
Special Publications Fund		53797	275532	51962	270853
Unrestricted funds:					
Grant Fund		30877		30000	
General Fund		124773	155650	133263	163263
			445569		448290

The accounts were approved by the Council of Trustees on 5 February 1998 and signed on its behalf.

Notes to the accounts for the year ended 31 December 1997

1. Accounting Policies

The Accounts of the Charity are prepared in accordance with the Charities (Accounts and Reports) Regulations 1995, the statement of recommended practice, Accounting by Charities, and with applicable accounting standards. They are drawn up on the historical accounting basis except that investments held as fixed assets are carried at market value.

1.1 Income
Donations and legacies are accounted for as soon as their amount and receipt are certain. In the case of donations this is usually when they are received. All other income is accounted for under the accruals concept. Gifts in kind are valued at their estimated value to the Charity.

1.2 Expenditure
Expenditure is accounted for under the accruals concept. The irrecoverable element of VAT is included with the item of expense to which it relates. Depreciation is allocated over the expenditure headings on the basis of the use of the assets concerned.

1.3 Tangible Fixed Assets
Tangible fixed assets are stated at cost or trustees' valuation less depreciation which is calculated at rates to write off the excess of cost over estimated residual values of individual assets over their estimated useful lives as follows:

Leasehold Buildings at Dinton Pastures	1/70th of cost
Fixtures and Equipment	10% of written down value

1.4 Investments
Fixed asset investments are stated in the balance sheet at mid market value at the balance sheet date.

1.5 Stock
Stock is valued at the lower of cost, including irrecoverable VAT, and market value, and consists of publications and sundries held for resale.

1.6 Restricted Funds
Restricted funds are subject to specific conditions laid down by the donors as to how they may be used.

2. Trading Income and Expenditure
Trading income is derived from the sale of the *British Journal of Entomology* to non-members of the Society and from sale of the Society's other publications; costs are those of printing and distributing these items.

3. Sundry Income
Sundry income in 1996 included the introduction of equipment not previously included in the accounts at a value of £40,000.

4. Tangible Fixed Assets

	Leasehold property £	Fixtures & equipment £	Total £
Cost			
At 1 January 1997	154736	48069	202805
Additions	–	859	859
Disposals	–	–	–
At 31 December 1997	154736	48928	203664
Depreciation			
At 1 January 1997	8840	4809	13649
Charge for year	2210	4419	6629
On disposals	–	–	–
At 31 December 1997	11050	9228	20278
Net book values			
At 31 December 1997	143686	39700	183386
At 31 December 1996	145896	43260	189156

Leasehold property represents the cost of building and equipping the headquarters at Dinton Pastures Country Park. The total cost of these premises which were completed during the year to 31 December 1993 is being amortized over the seventy year term of the lease.

A value for the library, collections, furniture and computer system has been assessed during last year in line with new accounting requirements and is included in fixtures and equipment.

5. Investments

In accordance with accounting requirements investments are shown in the balance sheet at market value.

	1997		1996	
	M.V.	Cost	M.V.	Cost
1230 Shell T & T	6510	1250	12441	1250
750 Unilever	4941	248	10624	248
M & G Charifund	61471	20238	50483	20238
Treasury 1999 9¼ %	2600	2392	2568	2392
Treasury 1997 8¾ %	3882	3688	3922	3688
Hendersons Bond	59007	58000	57568	58000
Sun Life Bond	56568	56000	55190	56000
Barings Bond	24291	25000	22805	25000
	219270	166816	215601	166816

6. Debtors

	1997	1996
Due within one year		
Trade debtors	561	781
Recoverable taxation	3714	2238
Prepayments and accrued income	2398	1100
	6673	4119

7. Cash at Bank and in Hand

	1997	1996
National Westminster Bank		
Capital Reserve	25108	29035
Societies Reserve	5257	73
Current Account	1914	1750
Eurocheque Account	77	129
Cash waiting to be banked	–	75
	32356	31062

8. Creditors: amounts falling due within one year

Trade Creditors	2342	1852
Accruals	4299	2237
	6641	4089

9. Funds

Analysis of net assets between funds

	Tangible fixed assets	Investments	Net current assets	Total
Endowment Funds				
Hering Fund	–	14387		14387
Restricted Funds:				
Housing Fund	143686	78049	–	221735
Special Publications	–	43775	10022	53797
Unrestricted Funds				
Grant Fund	–	30877	–	30877
General Fund	39700	52182	32891	124773
	183386	219270	42913	445569

The Hering Fund was endowed to make grants out of income for research in specific areas of entomology.

The Housing Fund consists of the property at Dinton Pastures and money put aside to finance its upkeep and eventual replacement. The funds were derived principally from bequests from the late Duke of Newcastle, Mr Crow and Mr Hammond.

The Special Publications Fund finances the Society's publications other than the *British Journal of Entomology*, and surpluses from such publications are credited to this fund to finance future publications.

The Grant Fund was set up in 1996 with funds derived from part of the old Bequest Fund which was closed with the intention of financing future grants for entomological research which would be authorized by Council but not so narrowly defined as those made by the Hering Fund. In 1997 the first grants were made from this Fund.

10. Grants

In addition to grants of £770 paid from the Hering Fund and £1200 from the Grant Fund, the Society has granted out of General Fund the following amounts, £2000 towards the Society's Second Expedition to Belize, £1400 towards the cost of publishing the *Larger Moths of Surrey* and £750 to the *Entomologists' Record.*

A. J. Pickles

BENHS Research Fund

This is the first year that grants have been awarded from this fund. The fund of £30,000 was set up in 1996 with the intention of using the income to assist entomological projects. The grants are available to assist with fieldwork on insects and arachnids that is related to conservation. They are also available for work leading to the production of identification guides and distribution lists of British insects. The grants are not limited to members of the Society and applications are welcome from all, but the work must have relevance to the British fauna. It is anticipated that a number of small awards will be given each year rather than one or two larger ones.

The sum available for grants in 1997 was £1200 and the applications received exceeded this figure. The applications were considered by a panel of seven members appointed by the Council. In order to spread the fund among as many applicants as possible the sums awarded were, with one exception, considerably less than those requested. The panel will expect future applicants to adhere more closely to the Society's guidelines for the size of the awards. The following awards were made:

1. Dr M. E. Archer, £300, to assist with a survey and comparison of the aculeate wasps and bees of selected Northumbrian sand dunes. Dr Archer has been working on the use of solitary bees and wasps for site assessment for conservation purposes since 1983. The grant will assist with completion of fieldwork on a comparison of the aculeate fauna of Cumbrian and Northumbrian sand dunes.

2. Mr R. F. McCormick, £300, to help finance the running costs of the Devon Moth Group. Moth recording in Devon has been neglected for many years, the last list having been produced in 1952. The large size of the county and the varied topography make it a difficult area to cover thoroughly. The formation of the Devon Moth Group in 1997 is enabling a co-ordinated approach to be made to record the present status of the Lepidoptera of the county. The grant will assist with the costs of the production of newsletters, interim distribution lists and travel costs to localities where records are needed.

3. Mr J. E. Milner, £345, to assist with the travel and accommodation costs of fieldwork in the Shetland Isles to survey the invertebrate fauna of native

woodland sites. A number of initiatives are being undertaken to assist the conservation and restoration of relict woodland on Shetland but very little is known about the associated invertebrate fauna. As many sites as possible will be examined during two visits in 1998 and the fieldwork will concentrate on the spider fauna.

4. Dr M. G. Morris, £255, to meet the costs of visits to the Natural History Museum in London to use the collections in connection with the preparation of handbooks for the identification of British weevils. Dr Morris is the leading authority on the British weevils and is working on a series of five volumes on weevils in the Royal Entomological Society's series *Handbooks for the Identification of British Insects*. One volume is already published and another is in press. The grant will enable him to consult the collections and the museum's experts with the objective of producing the third volume which will cover the subfamilies Cleoninae to Erirhininae.

JOHN MUGGLETON

PROFESSOR HERING MEMORIAL RESEARCH FUND

The Committee agreed to make just a single award this year. The sum of £400 enabled Dr Sergej Sinev, from the Russian Academy of Sciences, St Petersburg, to make a visit to the Natural History Museum, London, to study type material of Microlepidoptera. Dr Sinev is working particularly on the Cosmopterigidae for the series *Microlepidoptera of Europe*. Dr Sinev has collected much new material from the Gornotajozhnaya Research Station of the Russian Academy of Sciences, about 20 km east of Ussuzijsk, and from the Kedrovaya Pad'Natural Reservation in the most southern part of the Primorye area. Many specimens have been reared from the larval stage. The Hering Fund covered part of the cost of this fieldwork and it was considered highly appropriate that we should help Dr Sinev to study type material relevant to his project.

Because of his success in gaining a professional position in New Zealand, Mr Robert Hoare, currently completing his PhD on Nepticulidae at the Australian National University and the Australian National Insect Collection, Canberra, was unable to make his visit to New Caledonia. He will return his award to the Treasurer.

Professor Rimantes Puplesis, from the Vilnius Pedagogical University, who was awarded a grant for fieldwork in Eastern Siberia gained approval from the Committee to use it instead for fieldwork in Belize. The revised project is also for the collection of Nepticulidae, and it will be of particular interest to discover what a specialist collector finds in a family of moths considered to be predominantly temperate in distribution.

Dr Margaret Redfern, who is associated with Sheffield University, has reported on her attendance, which was funded in part by the Hering Fund, at the International Symposium on Gall-Inducing Arthropods. Dr Redfern presented a paper on her work on the interaction between the gall midge *Taxomyia taxi* and its parasitoids, which will be published in the symposium volume. She emphasized the great value she gained at the meeting in discussing her work with many other leading workers on gall biology.

The microscope belonging to the Fund remains on loan to Mr David Morgan. He is using it to help prepare 600 figures for a book on bees, which is being written by Mr George Else.

Publications arising from Hering Fund support

Mozuraitis, R., Buda, V., Borg-Karlson, A-K. and Ivinskis, P. 1997. Chemocommunication in *Phyllonorycter ulmifoliella* (Hbn.) (Lepidoptera: Gracillariidae): periodicity, sex pheromone, and inhibitors. *Journal of Chemical Ecology* **23**: 175–189.

Gange, A. C. & Nice, H. E. 1997. Performance of the thistle gall fly, *Urophora cardui*, in relation to host plant nitrogen and mycorrhizal colonization. *New Phytologist* **137**: 335–343.

Librarian's Report

A lot of progress has been made with the library over the past year. The books and journals which were sent for repair and binding that I referred to in last year's report have been returned and all who have seen them have been impressed with the results. Repair and conservation of old material is a highly specialist undertaking. If this is not done competently it can do more harm than good. Having satisfied myself of the workmanship of those I was dealing with in this matter, I sent a consignment of around 30 items for conservation work and hope to receive these in fully restored condition soon.

The cataloguing of new additions has progressed well. I spent part of my summer holidays at Dinton Pastures and, with the help of Stephen Miles, have now finished the books that were bequeathed to the Society by Eric Bradford and Humphrey Mackworth-Praed. In addition, the remainder of the Gould bequest has also been processed. The completion of this task, which has taken more than two years now, was a major target I set this time last year and I am pleased to report its successful completion. These items, totalling more than 1500 titles, are now on the shelves and may be used by members. I hope to be in a position to offer Duplicate items for sale to members at the Society's 1998 Annual Exhibition.

In July I chaired a meeting of the Library Committee at Dinton Pastures. The express aim of this meeting was to draw up a list of new publications for purchase, the first such exercise for three or four years now. I was pleased with the outcome, as after several hours those present managed to agree a list of 35 titles covering a wide range of subjects. Most of these have been published in the past four or five years and should be delivered shortly.

Those of you who have visited the Pelham-Clinton building recently will have noticed that at long last I have got round to labelling and colour coding the book case locks and keys. This, in turn, has necessitated the acquisition and installation of a key box. The result is improved stock control, security and efficiency, saving much time as the correct keys can now be quickly located.

This year we have added two new journal titles to our shelves, *Oedippus* on an exchange basis and *The Coleopterist* which we shall be purchasing. Back numbers of this publication have been received and catalogued. I would like to thank John Muggleton for his continued efforts in this area.

I have decided to make my next target the binding of some of our unbound journal back numbers. This will, I hope, take place during the coming year as I have had to prioritize things due to work commitments over the last few months. Ultimately, I intend to establish a second data base along the lines of the one we use for the books, to hold the details of our bound journal volumes. However, this is a long-term project that is unlikely to be completed for several years.

Finally, I wish to thank Bernard Verdcourt for donating books during this period.

Ian Sims

Curator's Report

There has been steady progress, stepped up in the latter half of the year due to an increase in my personal availability. It is hoped that this will continue, with the aim of improving the layout and accessibility of the collections at open days and workshop meetings.

The five-year loan from Reading Museum of Russell Bretherton's collection of European butterflies expired at the end of 1997. Following a visit to view the collection by David Notton of the Museum, an extension of this loan has been arranged. To accord with their usual loan agreements, this renewal is for a two-year period although it is likely that subsequent extensions will be granted on the same basis. As part of this collection is housed in a 30 drawer cabinet belonging to the Society, a comparable 40 drawer cabinet has been supplied by Reading Museum to enable the specimens to be transferred.

It has also been agreed that the Bretherton collection will remain a separate entity and will stay in its present arrangement. Now the position regarding this collection has been clarified, it has been possible to proceed with the long-planned rationalization of the other European butterfly collections held by the Society. The four remaining collections—Mackworth-Praed, Lister, Coleridge and Stoughton-Harris, are now being integrated into a single collection. This is being arranged according to the checklist of the Lepidoptera of Europe by Ole Karsholt and Jozef Razowski. Within species, the existing labelling according to country or region of origin is being retained as well as arrangement under named subspecies or forms where indicated. Duplicate specimens of all commoner species are inevitably being removed from the collection.

As previously indicated, the Torstenius collection, which includes both butterflies and larger moths, will remain separate. Some further specimens, donated by Stig Torstenius, have been received via Barry Goater.

The European moths from the Mackworth-Praed collection have been removed from store boxes to a 20 drawer cabinet, together with the few European moths previously held. The collection was arranged according to Bradley and Fletcher with non-British species interpolated. This arrangement has been maintained as a temporary situation, pending any further acquisition of European moths in the future.

David Moore continues with the arrangement of British macro moths. He is now on the last lap, progressing through the Noctuidae, so it is expected that the present rather confused arrangement will soon be overcome and the accurate labelling of the cabinets can be restored. How best to tackle the micro moths will then be considered.

Consequent to the ongoing rearrangement of British and European collections, store boxes and several cabinets are being sold. As there are already potential buyers for some cabinets, anyone interested in obtaining a cabinet is requested to contact me as soon as possible. The proceeds of all sales will be used to purchase further 15 drawer units of the type obtained two years ago.

The transfer of the smaller orders to these new units has been completed. These now house the Ephemeroptera, Plecoptera, Odonata and a few specimens of six other small orders in addition to the Trichoptera, Neuroptera and allied orders previously transferred.

As mentioned last year, the Hymenoptera cabinet has been a perennial *Anthrenus* problem and another infestation in the hornets and bumble bees was discovered a few months ago. Rehousing of the aculeates became urgent and the remaining drawers of the new cabinets have been filled with them. At the same time, I

incorporated my own aculeate collection, which is a donation to the Society and especially boosts the small black solitary wasps. All specimens were determined by either John Felton or George Else, so the accuracy of identifications in this collection remains assured.

Specimens have also been donated by Andrew Halstead, Colin Hart, Roger Hawkins, John Muggleton, Matthew Smith and Bernard Verdcourt. Andrew Halstead continues to build up the sawfly collection and I am indebted to him for his assistance in this area. It will be the first priority to transfer sawflies and other Hymenoptera when further new units are obtained.

Worries over the introduction of livestock into the building expressed last year continue and care in this respect during workshop meetings is requested. The stick insect reported last year as discovered in the building reached maturity and survived a trip to Switzerland, but died without offspring in November; no more have been found. Also a wingless booklouse found on the wall of the library has remained a unique specimen. It was determined by Bryan Turner as *Psyllipsocus ramburii*, another addition to the Dinton list. Spiders, however, are frequently intercepted so must be finding enough food, if only those insects which enter when the door is opened or left ajar, a common problem because of the slow closing mechanism. There have been at least two more alarm activations by spiders, both during the hours of darkness.

The finding of a live cinnabar moth, which had evidently spent a week in the building, will probably not be repeated, as the weedy area in front of the building, which supported a colony of this insect, has now regrettably been replaced by gravel as part of the presentation by the Country Park of a new pond life display in their exhibition area.

The Thames Valley Police wrote to us about false alarms in June, saying that support will be withdrawn after more than 7 false alarms in a year (we haven't reached that level yet). They cite insect infestations as the second most frequent cause. The need for more effective cleaning and pest control is paramount so will continue to be addressed.

The cleaning and sealing of the floor, which has deteriorated in condition, will be carried out in the near future. I am grateful to Ian McLean for his adept use of the vacuum cleaner following the recent workshop on insects in stems. Portions of stem, however, still lurk on furniture, etc., so I hope a spring emergence of adults from the boring larvae inhabiting them is not to be anticipated.

PETER CHANDLER

EDITOR'S REPORT

It was in July last year that I talked myself into becoming the new Editor of the *Journal*, taking over from Richard Jones, who was Editor for 10 years. The handover has been smooth, and the learning curve steep, but obviously the membership will be aware of delays in publishing the two last parts of the *Journal* for 1997. I apologize for these delays. However, Spring 1998 will bring both these last parts and also the beginning of Volume 11. On behalf of the membership I would like to thank Richard Jones for all his hard work in organizing a fine journal to a very high standard. The *Journal* would not exist without those who have written articles, short communications, field meetings, and without the compilers of the Annual Exhibition Reports. It will continue to need these contributions if it is to reflect the diverse interests of the membership. Richard has been helped over the past years by many people, but I

want to mention and thank Raymond Uffen and Roger Hawkins in particular for their keen attention to detail in checking proofs. I have already had cause to appreciate their efforts for what is so often a thankless task, but one that gives a very professional look to the final product.

MICHAEL R. WILSON

THE 1997 PRESIDENTIAL ADDRESS—PART 1 REPORT

DAVID J. L. AGASSIZ

23 St James Road, Gravesend, Kent DA11 0HF.

I am happy to tell you that this has been a quieter year for the Society than have many in recent years. When I last held this office 18 years ago it was much more demanding with two ordinary meetings a month and a Council meeting virtually every month. No less though is the Society's debt to its principal office holders: the Secretary, Treasurer, Librarian, Curator and Meetings Officers as well as to those behind-the-scenes workers who sell publications, operate projectors, manage premises, collect subscriptions, mail journals and so on. The quiet efficiency of people like Gavin Boyd, David Young, Peter Chandler and the rest in selling publications, distributing journals and notices or keeping an eye on the premises needs to be seen to be believed.

I would like to make special mention of the Meetings Officers. Ian McLean has arranged a varied and interesting programme both of evening meetings in London and of workshops at Dinton Pastures. Although the attendance at Ordinary Meetings, measured by those who sign the book, has decreased the number at times has been quite respectable. I understand that some workshops and Open Days at Dinton Pastures are attended by as many as the premises can accommodate. Regrettably since I live the opposite side of London from Dinton Pastures I have been unable to support these meetings as much as I would have liked. No less successful have been the Society's Field Meetings, arranged by Paul Waring, now firmly established on a country-wide basis with continued ventures beyond our shores. It is these gatherings of entomologists where information is shared and new insights learned that are among the most important activities of a Society like ours.

A year ago my predecessor Colin Hart reported on the need for a new Editor and during the year we were very pleased to learn that Dr Mike Wilson had agreed to take over this responsibility. Richard Jones is released after long and distinguished service which has seen the *Journal* not only change its title, but maintain an excellent standard and prove the wide spectrum of interests contained within our Society. We owe Richard a great debt for holding a burdensome office for all those years.

You have heard in the Council's report of the establishment of a new Research Fund, such is the financial good health of our Society.

Happily, most of our members have kept in good health this year and, as you have heard, a further six have completed 50 years as members and been elected Special Life Members and I have only four deaths to announce to you since I took office.

Professor C. C. Smith died on 16 February 1997, a member since 1989. Colin Smith was a distinguished professor of Spanish at Cambridge. He was a leading authority on medieval Spanish literature and author of many authoritative works. As an entomologist he was an encouragement to a number of younger entomologists,

such as undergraduates in his College. His chief claim to fame was the discovery in 1990 of *Agrochola haematidea*, the Southern Chestnut, new to Britain. Obituaries were published in national papers including *The Times*.

R. F. Haynes died on 5 June 1997; a Special Life Member, he had been a member since 1938. Raymond Haynes was known to members as a regular attender at the Annual Exhibition even though he had a long journey from Killarney in Co. Kerry. Prior to his move to Ireland he lived in the Dorking district and in both places was an active lepidopterist.

Group Captain L. W. Burgess died in June 1997; he joined the Society in 1958. He was a lepidopterist who retired to live in the New Forest, and who also painted butterflies in water colours.

T. C. Dunn died on 1 August 1997; he had been a member since 1956. Tom Dunn was a well known member, especially in the north of England where, as county recorder for Durham, he was mentor to many other entomologists. He was senior author of books on the macro- and microlepidoptera of Durham and received an MBE for his services to Natural History.

BENHS FIELD MEETINGS

Ryton Wood (Warwickshire Wildlife Trust) near Coventry, Warwickshire, 11 May 1996

Leader: **Roger Kendrick**. Several days of cold and wet weather prior to this field meeting had interested parties ringing up to confirm the meeting would go ahead. It also did not bode well for the finding of new species in this site of special scientific interest that is owned by Warwickshire Wildlife Trust (WWT), who are in the process of reinstating a coppice regime and also widening the major rides in the wood (primarily for the benefit of several fritillary butterfly species). Unfortunately, the weather also deterred most of those who attended (nine members and local entomologists in total) from setting traps in the centre of the wood (in amongst stands of small-leaved lime, *Tilia cordata*), where much less recording (and thus the objective of this meeting) has taken place. In total 10 mercury vapour light traps and three fluorescent light traps were operated from dusk (21:00; 8.3 °C) for about four hours, when the temperature (7.0 °C) stopped any further movement of moths. Very few moths appeared early on, although between 22:00 and 23:00, the more sheltered traps saw a steady trickle of *Polyploca ridens* (Fab.) and *Peridea anceps* (Goeze). Almost all the other species appeared in ones or twos. Other notable species recorded were *Agonopterix ocellana* (Fab.), *Lobophora halterata* (Hufnagel), *Plagodis pulveraria* (L.), *Drymonia ruficornis* (Hufnagel), *Clostera curtula* (L.), *Nola confusalis* (H.-S.) and *Laspeyria flexula* ([D. & S.]). A total of 29 moth species were recorded, somewhat lower than could have appeared at this entomologically rich site, no doubt due to the poor weather. Further work still needs to be undertaken to elucidate the moth fauna of the small-leaved lime stands in the centre of the wood. Elsewhere in the wood, recent recording revealed *Euphyia biangulata* (Haworth) present and breeding in the early 1990s, well outside its previous known range—could there be other species here that have been overlooked by not recording the stands of lime? I

would like to thank the WWT for giving permission for the BENHS to access the site and arranging for wheelbarrows to cart the generators to the middle of the wood. A full list of the species recorded has been sent to WWT and to the BENHS.

Bookham Common, Surrey, 29 June 1996

Leader: **Graham A. Collins**. The purpose of this field meeting was to try to discover the current status of various moth species formerly recorded at or in the vicinity of Bookham, especially *Dicycla oo* (L.) (heart moth), but in view of the potential richness of the area a daytime meeting was also held. Unfortunately the weather was against us, the afternoon being both cool and overcast, and only four members attended. A walk around the common beating and sweeping produced various insects including several larvae of both *Aleucis distinctata* (H.-S.) (sloe carpet) and *Eupithecia dodoneata* Guen. (oak-tree pug), together with an adult of the snakefly *Subilla confinis* (Steph.) (Raphidioptera) which would appear to be very scarce in Surrey.

After a good meal in a local hostelry we were even more disappointed to discover that the sky had cleared and the temperature had dropped even further. Six light-traps were run in the centre of the common but the catch was very poor with only 43 species of macromoth recorded. Needless to say there was no sign of *oo*, the most interesting captures being: *Hypomecis roboraria* ([D. & S.]) (great oak beauty), and *Elaphria venustula* (Hübn.) (rosy marbled). A single example of the pyralid *Microthrix similella* (Zinck.) was also taken.

Warburg Nature Reserve, Bix Bottom, Oxfordshire, 3 May 1997

Leader: **Ian Sims**. This field meeting, the first of the year, was held at Warburg Nature Reserve. The aims were to search for larvae of *Eriocrania chrysolepidella* Zell. feeding in hazel foliage and other eriocranids mining birch, and for larvae of tineids in bracket fungi. Also, it was intended to search nearby beech woodland at Nettlebed for adults of *Coleophora antennariella* H.-S. in flight around hairy wood-rush (*Luzula pilosa*), its larval foodplant.

The meeting convened in the car park of the Berkshire, Buckinghamshire and Oxfordshire Naturalists' Trust building at Warburg Reserve (SU720879). This is a 254 acre site of special scientific interest and includes large tracts of beech woodland, hazel coppice and scrub with some chalk downland. The day started sunny, hot and calm. By 14.00 hours the sky had become overcast and the day got hotter as the humidity increased. The humid conditions persisted until the following morning, although the temperature fell slightly during the night. The start of light drizzle at 11.00 hours on the Sunday morning marked the end of this hot spell of weather the country had enjoyed for the past two weeks or so, and the end of the meeting as far as the leader was concerned.

Around 15 members and friends gathered for the morning meeting. After an introductory talk by the Assistant Warden, Rod D'Ayala, the party walked a circuit of the reserve recording Diptera, Hymenoptera and Lepidoptera. Twelve species of Rhopalocera were seen, however none of these were particularly noteworthy. Unfortunately, despite extensive searching the larval feeding sites of *E. chrysolepidella*, one of the species targeted for this meeting, were not found. This demonstrates the almost certain absence of the moth from this site. However, larvae

of five species of birch-feeding eriocranids were found, all of these being new records for the reserve. Larval feeding sites of the tineid *Nemapogon clematella* (Fab.) were common on dead coppiced hazel boughs infected with the fungus *Diatrype disciformis*. Some members of the party took samples of the fungus *Hypoxylon multiforme* growing on cut and stacked birch branches. From this material several subsequently succeeded in rearing the uncommon tineid *Nemapogon wolffiella* Karsh. & Neil. Singletons of the homopterans *Centrotus cornutus* (L.) and *Cercopis vulnerata* Ill. were noted near the car park and mating aggregations of the shieldbugs *Eurydema oleracea* (L.) (brassica bug) and *Dolycoris baccarum* (L.) (Sloebug) were also seen in the area known as the old rifle range. Along the way several unusual species of plant were pointed-out by Rod, including many examples of solomon's seal (*Polygonatum multiflorum*) and herb paris (*Paris quadrifolia*).

Lunch was taken back at the meeting place, where many of the morning's sightings were discussed. Some members of the party had seen a large herd of fallow deer grazing in the fields bordering the reserve, no doubt partly responsible for the widespread grazing damage Rod showed us in the forested areas of the reserve. During the lunch break the party saw and heard red kites in flight overhead. This nationally rare raptor has become increasingly common in the area since the release of around 50 pairs in the early to mid nineteen eighties.

After lunch the wooden fencing around the car park was discovered to be a favourite oviposition site for *Rhyssa persuasoria* (L.), the host-specific parasite of the great wood wasp *Urocerus gigas* (L.). Most of the party saw males in flight and female wasps settled on the wood. These were in the process of arching their backs and drilling their exceptionally long ovipositors into the wood in search of their hapless prey. We then left the reserve and drove to the beech woods at nearby Nettlebed Common (SU701868) to search for *Coleophora antennariella*. This moth was discovered in a very limited part of these woods by Waters in 1925, but has not been recorded in the UK since his death in 1930. Unfortunately, the precise location where it occurred is not known. According to Waters the moth was localized to a small area and at this time of year adults should be seen flying around their larval food plant from about 16.00 hours. Hairy wood-rush was by no means common in the area and, despite an extensive search, no adults resembling this moth were found. One member of the party found two coleophorid cases attached to beech trunks in the manner of this species but unfortunately these were not *C. antennariella*.

The lack of a coleopterist amongst our numbers was felt when a long-dead fallow deer was found close to where the cars had been parked. This was host to many species of carrion beetle, the numbers of individuals being too numerous to count. As non-coleopterists we 'squeamish other-orders people' did not investigate these too closely, let alone take examples for future identification. An opportunity lost, although not really regretted by many of those present I think! The most striking of these beetles was *Oiceoptoma thoracicum* (L.), many of which were seen mating, with females ovipositing on the carcass and surrounding soil.

At around 18.00 hours the party met again back at Warburg where the day shift departed and those remaining retired to a local hostelry to eat and compare notes on the day's events before the arrival of the night shift.

The mercury vapour (mv) part of the meeting convened at 20.00 hours back at Warburg. Around six of the original party remained for at least part of this session. These were joined by several other groups as the night progressed, swelling our numbers once again to around 15. A total of eight mv and two actinic traps were run throughout the reserve, including areas that had not been worked in previous years.

By midnight our ranks had dwindled somewhat, but those who stayed for the duration were rewarded with a mild, cloudy and humid but otherwise dry night. During this session new species of lepidoptera recorded for the reserve, or of noteworthy status, included the red-green carpet *Chloroclysta siterata* (Hufn.), oak-tree pug *Eupithecia dodoneata* Guen., early tooth-striped *Trichopteryx carpinata* (Borth.), light feathered rustic *Euxoa cinerea* ([D. & S.]) and Oak Nycteoline *Nycteola revayana* (Scop.). The unusual nature of the season was highlighted by the inclusion of Lepidoptera normally associated with spring such as the water carpet *Lampropteryx suffumata* ([D. & S.]), brindled beauty *Lycia hirtaria* (Cl.), powdered quaker *Orthosia gracilis* ([D. & S.]), common quaker *O. cerasi* (Fabr.), clouded drab *O. incerta* (Hufn.), hebrew character *O. gothica* (Linn.) and chestnut *Conistra vaccinii* (Linn.) with those normally seen in high summer such as the small heath *Coenonympha pamphilus* (L.). The phoenix *Eulithis prunata* (L.), tawny-barred angle *Semiothisa liturata* (Cl.), pine hawk *Hyloicus pinastri* (L.) and brown rustic *Rusina ferruginea* (Esp.). Never before have I come close to seeing *L. hirtaria* and *H. pinastri* on the same night!

All-in-all I feel that this meeting succeeded in its aims. A total of 167 species of day and night-flying Lepidoptera and lepidopterous larvae were recorded (61 micros and 106 macros including Rhopalocera). A total of 17 'macros' and 46 'micros' were new records for the reserve, indicating that this site is under-recorded. It was a pity that we did not see *antennariella* though, but with the unusual timing of many of the macros seen at light it is possible that we may have missed its flight period. The dipterists did well, despite the weather being 'too hot' during the day. Several remained to work the lights during the night. *Myathropa florea* and *Volucella bombylans* were recorded for Warburg and *Bombylius major* and *Ctenophora flaveolata* were recorded at Nettlebed Common. The hymenopterists fared slightly better, recording *Andrena bucephala*, *Nomada striata* and *Osmia bicolor* at Warburg and *A. scotica*, *A. haemorrhoa* and *N. flava* at Nettlebed. A further record of interest for Warburg was the ant beetle, *Thanasimus formicarius*.

Those who attended this first field meeting of the year were lucky with the weather, a better day from this respect could not have been hoped for. Indeed, two or three days later it snowed! A full species list has been supplied to Rod and lodged in the 'shoe box' (D. Wilson, *BJE&NH*, **10**, pp. 37–38) at the Society's rooms at Dinton Pastures.

Old Sarum and Grovely Wood, Wiltshire, 31 May 1997

Leaders: **Paul Waring & Rachel Thomas**. This field meeting comprised a morning session at Old Sarum, an afternoon session in Grovely Wood and night-time sessions simultaneously at both sites. Sixteen members and friends attended the morning and afternoon sessions and a further eleven members and associates arrived for the night work.

When we arrived at Old Sarum at 11.00 hours the weather was already sunny and hot, with a clear blue sky. The hedgerows and grassland were gloriously green and lush following ample rain in May. Brightly coloured antique biplanes and triplanes flew over Old Sarum occasionally from a nearby vintage air show, which was an added bonus for some members. Before we got to grips with the wildlife, Dr Rachel Thomas, on behalf of English Heritage, gave us a brief introduction to the site, its history, main features and management.

Old Sarum is an iron-age hill fort and the former site of Salisbury Cathedral. It is now managed by English Heritage and consists of a circular moat and associated steep banks and other earthworks. These are covered mostly by agriculturally unimproved rough chalk grassland which has a history of episodic grazing, mainly by sheep. Scrub has grown up on some parts of the site, particularly on the west side, and in one area this has developed into shady woodland. One feature of particular interest in the grassland on the sides of the moat is a large population of the Dark Mullein *Verbascum nigrum* L. which used to support a colony of the Striped Lychnis moth *Cucullia lychnitis* Ramb. (de Worms, 1962). Several searches from 1990 onwards suggest the moth has been lost from the site, possibly due to scrub encroachment in the past. In 1992 an attempt was made to re-establish the moth on the site with the release of forty larvae. No adults or larvae were seen in the following years until 1996 when there was an unconfirmed sighting of a larva by a member of the English Heritage staff who had been supplied with the details of how to distinguish the caterpillar from those of the more widespread Mullein moth *C. verbasci* L. There was a slim chance that the adult moth might be seen at light at the end of May, particularly this year because the moth season was running a week or so early at the time of the field meeting. However, none were seen.

Our main objective at Old Sarum was to investigate the insect-life associated with the scrub so that the fauna can be taken into account by English Heritage in formulating a management plan. Some control of the scrub has been undertaken in the past to prevent plant roots undermining and damaging the stone-work of the monument and to enable the historic form to be seen. We set out to see what insects we could find associated with the scrub and whether there were any nationally scarce or local species among them. The scrub consists mainly of common hawthorn *crataegus monogyna* Jacq., blackthorn *Prunus spinosa* L., dogwood *Cornus sanguinea* L. and wild privet *Ligustrum vulgare* L., with ample shrouds of traveller's joy *Clematis vitalba* L. and we also found and beat spindle-tree *Euonymus europaeus* L., elder *Sambucus nigra* L. and field maple *Acer campestre* L. There were also some taller trees, of ash *Fraxinus excelsior* L. and sycamore *Acer pseudoplatanus* L. in particular. A species we were especially keen to see if we could find was the larva of the nationally scarce barred tooth-striped moth *Trichopteryx polycommata* (D. & S.) which feeds on privet in May and June and was recorded as single adults in a Rothamsted light trap some 13 km to the east, on the eastern edge of Bentley Wood in 1989 and 1993 (Fox & Waring, in press). Accordingly, several members concentrated on beating privet throughout the morning. Most of the bushes accessible from the main paths were beaten, including both small and large ones in full sun on the south side of the site and others growing in more shaded conditions amongst tall trees (Fig. 1). Only one larva was found which approximated to the description of the barred tooth-striped, having black thoracic legs and black markings on the head, but the ground colour of the smooth unpatterned body was brownish rather than green. It was taken to be reared for confirmation but subsequently died (Allan Jenkins, pers. comm.). The numbers of larvae and species on privet are never high and on this occasion little was obtained except for a few larvae of the winter moth *Operophtera brumata* (L.) and a larva of the scalloped oak *Crocallis elinguaria* (L.) which might have fallen onto the privet from another species of shrub. Also found on the privet was a larval mine of the common gracillariid *Caloptilia syringella* (F.) and eleven adults of the common tortricoid *Pseudargyrotoza conwagana* (F.) which feeds as a larva on privet and ash. Twelve adults of the incurvariid *Adela croesella* (Scop.) were seen by Stephen Palmer who remarked that despite living in Wiltshire for ten years up to 1993, he had never seen so many in one

Plates:
(1) Warren Gilchrist and Allan Jenkins and family beating privet in an area of mature scrub at Old Sarum.
(2) Mike Wilson suction-sampling on the edge of the scrub at Old Sarum.
(3) A selection of nets in use at Old Sarum including standard and kite nets for insects on the wing and a sweep net for insects in the sward.

place at one time as on this day. He found it rather local in Wiltshire. The larva is believed to develop in the flowers of privet.

A nearly fully grown larva of the Small Emerald *Hemistola chrysoprasaria* (Esp.) was beaten from traveller's joy *Clematis vitalba* which also produced several larvae of the willow beauty *Peribatodes rhomboidaria* (D. & S.) and is also supporting good numbers of the small waved umber *Horisme vitalbata* (D. & S.), fern *H. tersata* (D. & S.) and pretty chalk carpet *Melanthia procellata* (D. & S.), as evidenced by the light trap catches in the evening. As usual in late May, hawthorn and blackthorn were more productive of larvae, yielding numbers of the winter moth, early moth *Theria primaria*

(Haw.) and dotted border *Agriopis marginaria* (F.) in particular. An elm produced a larva of the feathered thorn *Colotois pennaria* (L.). The adults of several species of moths were disturbed by day. They included singletons of two nationally scarce micro-moths, the plume moth *Hellinsia* (*Leioptilus*) *carphodactyla* (Hübn.) (det. Stephen Palmer) which feeds on ploughman's spikenard *Inula conyza* DC. and the ethmiid *Ethmia dodecea* (Haw.) (det. David Green) which feeds on gromwell *Lithospermum officinale*. At least one speckled yellow *Pseudopanthera macularia* (L.) was reported. Several fresh adults of the cinnabar moth *Tyria jacobaeae* (L.) were also flushed.

Butterflies were not numerous, most species occurring in ones or twos, but the speckled wood *Pararge aegeria* (L.) was frequent amongst the more mature scrub. A male and female green hairstreak *Callophrys rubi* (L.) were noted visiting elder flowers, one of several holly blues *Celastrina argiolus* (L.) was seen inspecting dogwood buds, and a worn red admiral *Vanessa atalanta* (L.) was observed basking in the woodland. Other butterflies seen included male and female brimstones *Gonepteryx rhamni* (L.), several common blue *Polyommatus icarus* (Rott.), brown argus *Aricia agestis* (D. & S.), large and green-veined whites *Pieris brassicae* (L.) and *P. napi* (L.) and large skippers *Ochlodes venata* (B. & G.) and singletons of the orange tip *Anthocharis cardamines* (L.) and small tortoiseshell *Aglais urticae* (L.).

Mike Wilson from Cardiff brought along a suction sampler and multi-barrelled pooter (Fig. 2), which he used to sample Homoptera from the grass sward. A range of early summer and overwintering species was found.

Member Mike Salmon lives close to Old Sarum and had been working the site since the beginning of the season, resulting in a collection of over one hundred beetle species so far, which he is identifying for subsequent publication. He identified various beetles for other members during the meeting, including the attractive metallic green oedemerid beetle *Oedemera nobilis* (Scop.) which we found quite commonly in the grass near the scrub.

Stephen Palmer recorded several common species of hoverfly (Syrphidae) and ladybird (Coccinellidae).

Several common lizards *Lacerta vivipara* L. were seen amongst the longer grass.

We all gathered for a picnic by the ruins before proceeding in convoy to Grovely Wood for the afternoon.

The western part of Grovely Wood is in the hands of the Forestry Commission (FC) who kindly supplied a permit, key and stock-map for the meeting. The eastern portion beyond Grovely Lodge remains in private ownership and we did not visit or collect any records from this area. The wood is on chalk, with a thin soil and consists largely of rather even-aged plantations of beech *Fagus sylvatica* L. and Norway Spruce *Picea abies* (L.) dating from the late 1950s to the early 1970s. A few stands of derelict coppiced hazel *Corylus avellana* L. remain, largely at the edges of the wood. A broad built up ride runs through the wood in an approximately west–east direction from the main entrance and along this a series of bays have been cleared to allow a ground layer of herbs and forbs to thrive, with margins of native shrub species, particularly on the sunny north side of the ride. Minor rides lead off the main one at intervals to the north and south. Along these we found occasional bushes or trees of privet, sallows *Salix* spp., field maple and broom *Cytisus scoparius* (L.). In a couple of the bays we saw flowering butterfly orchids *Platanthera* sp. and others had flowering pignut *Conopodium majus* (Gouan), masses of wood spurge *Euphorbia amygdaloides* L. and plenty of tufted vetch *Vicia cracca* L. and greater bird's-foot trefoil *Lotus uliginosus* Schkahr.

We searched without success for the drab looper *Minoa murinata* (Scop.) and larvae of the barred tooth-striped but obtained a couple of larvae of the engrailed

Ectropis bistorta (Goeze) from the privet and flushed a couple of fresh speckled yellow from amongst wood-sage *Teucrium scorodonia* L. in the process. Other species beaten as larvae included the July highflyer *Hydriomena furcata* (Thunb.) and mottled umber *Erannis defoliaria* (Clerck) from hazel, the dunbar *Cosmia trapezina* (L.) and a sprawler *Brachionycha sphinx* (Hufn.) from goat willow *Salix caprea* L., a brindled green *Dryobotodes eremita* (F.) from pedunculate oak *Quercus robur* L. and a larva of the twin-spotted quaker *Orthosia munda* (D. & S.) was found 1.5 m up a bole of ash (A. Dobson). Several vacated leaf-mines were found on a single hazel bush by David Green who determined them as of the nationally scarce micro-moth *Eriocrania chrysolepidella* Zeller. An early purple hairstreak *Quercusia quercus* (L.) was seen amongst the oaks. A fresh brown argus was seen on the main ride, along with a few common blue and grizzled skipper *Pyrgus malvae* (L.), but most of the other rides were narrow and only the speckled wood was frequent in these. A common buzzard *Buteo buteo* (L.) flew out of a tree along one of these and several roe deer *Capreolus capreolus* L. and muntjac *Muntiacus reevesi* (Ogilby) were seen. Silver-ground carpets *Xanthorhoe montanata* (D. & S.) and grey pine carpets *Thera obeliscata* (Hübn.) were quite numerous.

Mike Wilson collected more suction samples from grassy ridesides within the wood and from some chalk grassland bordering the north-east end of the FC holdings.

At the end of the warm sunny afternoon some members departed the wood for evening meals in various local pubs before returning to Grovely Wood, while most of the new arrivals at Old Sarum set up light-traps there for the evening session. By dusk we had at least six mercury vapour (mv) light traps and one actinic trap running at Old Sarum and five mv traps at Grovely Wood. FC Forest Ranger Colin Elford joined the party in Grovely Wood for the evening session. The evening was clear, starry and with no moon. At Grovely Wood two churring male nightjars *Caprimulgus europaeus* L. were heard, woodcock *Scolopax rusticola* (Scopoli) made their dusk flights and tawny owl *Strix aluco* L. and little owl *Athene noctua* L. were recorded. A cold wind developed before dusk, though this abated somewhat after dark. The dusk temperature was 15 C at the open car park at Old Sarum, quickly falling to 12 C, but we felt substantial differences in temperature between the warmer top and colder bottom of the moat and between the open grassland and the shelter of the woodland. Not surprisingly the catches at the bottom of the moat were smaller than in the woodland. All the traps at Old Sarum were packed up around 01.00 hours as well as all but one at Grovely Wood. In view of the unpromising weather, we were pleasantly surprised at the number of species of moths recorded and in the more sheltered spots the moths arrived fairly steadily for the first couple of hours after dark. Many of the species we found are dependent on the woody plants which compose the scrub. The grassland was found to be supporting populations of the fox moth *Macrothylacia rubi* (L.), light brocade *Lacanobia w-latinum* (Hufn.) and the netted pug *Eupithecia venosata* (F.). Several of the latter came to light, one recorder had four, which is unusual in the experience of all of us, singletons being the norm if they turn up at all. The larva feeds on the ripening seedpods of bladder campion *Silene vulgaris* L. Several recorders reported the pimpinel pug *Eupithecia pimpinellata* (Hübn.) which qualifies as a nationally scarce species, though it would probably be found more widely if more effort was spent in searching for the species as larvae on the foodplant, burnet saxifrage *Pimpinella saxifraga* L. The composite list of macro-moths at light for the night at Old Sarum exceeded sixty species, and reached one hundred at Grovely Wood. As neither site appears to have been light-trapped to any extent before, both lists represent substantial additions and updates

to the available knowledge for the sites. English Heritage had only a couple of moth species on their data-base for Old Sarum previously and there are only a few old records for the site in de Worms' county list. Grovely Wood has been worked relatively little for moths in recent years but de Worms' county list includes reference to a number of nationally scarce and local species from the site in the decades prior to the large-scale planting of conifers in the wood.

The results from this field meeting indicate that Grovely Wood still supports a large range of moth species and merits more in-depth entomological survey work. Of greatest interest among the catches at Grovely Wood were the great oak beauty *Hypomecis roboraria* (D. & S.), brindled white-spot *Paradarisa extersaria* (Hübn.), square spot *P. consonaria* (Hübn.) and orange footman *Eilema sororcula* (Hufn.), all moths of southern woodland and scrub, fortunately still well represented in the woods of south Wiltshire and Hampshire.

Incidental visitors to the light-traps at Grovely Wood included hornets *Vespa crabro* L. and single larvae of the twin-spotted quaker *Orthosia munda* (D. & S.), small quaker *O. cruda* (D. & S.) and common quaker *O. cerasi* (F.). All three larvae fell onto the light trap sheets from the oak trees above. All were fully fed and presumably taking the quickest way down to pupate in the earth.

Regarding the scrub at Old Sarum, our results demonstrate that there is a considerable moth fauna dependent on the various woody species on the site, which would be lost from the site if the scrub was cleared entirely. None of the scrub-dependent species we found are nationally scarce and all have many other breeding sites in south Wiltshire. However, nationally scarce species may be present yet and might be found if searches were made at other times of the year or concentrated on species other than the Lepidoptera. Follow-up searches for adults of the barred tooth-striped in the spring are recommended in particular. The nationally scarce moth species recorded during the meeting are dependent on ploughman's spikenard, gromwell and burnet saxifrage, and bladder campion is important here for the netted pug. All of these grassland species tend to be associated with scrub, bushy places and hedgerows rather than growing in open grassland and short swards. For all of these reasons retention of some scrub on the site is to be recommended and efforts should be made to maintain good stands, of varying height, of all the key plant species.

We would like to thank all the members for such strong support of the meeting; the custodial and regional staff of English Heritage and the Forestry Commission for permission to hold the meeting and for help with the necessary arrangements; Forest Ranger Colin Elford for joining us at Grovely Wood and for his practical management work which has improved the plantations for wildlife; Geoff Martin for co-ordinating the light-trapping at Grovely Wood while the principal leaders were at Old Sarum; and Una and David McMaster for providing accommodation. Copies of this report and full annotated species lists have been supplied to English Heritage, the Forestry Commission and have been entered on the data-base of the National Moth Recording Network for onward transmission to the Invertebrate Site Register.

References

de Worms, C. 1962. *The Macrolepidoptera of Wiltshire*. Wiltshire Archaeological & Natural History Society.

Fox, B. W. & Waring, P. in press. The moths and butterflies of Bentley Wood and Blackmoor Copse on the borders of South Wiltshire and Hampshire. *Entomologist's Gazette*.

Bellever Forest, Dartmoor, Devon, 28 June 1997

Leader: **Roy McCormick**. The leader and Ashleigh Rosier, a member of Devon Moth Group, arrived at the site to find that several people had already turned up; the only problem was that I had given the map reference to the wrong car park, so we had to wait beyond the allotted time so that we could make sure that all the people who wanted to attend knew where we would eventually finish up (the other end of the wood). It all turned out all right in the end. The night was a warm, dry, cloudy and still one in the middle of a number of extremely poor ones. I was surprised to be out in the middle of Dartmoor with these conditions after what we had seen so far (I fully expected to be rained blown off the moor). Nine people arrived; a better turn out than expected. Six were members of Devon Moth Group (with a couple of these belonging to BENHS or Butterfly Conservation) and three BENHS members.

Before the traps were placed we tried flushing out anything resting during the day; few species were seen and added to the list but not the one we were looking for (*Eupithecia abietaria*, cloaked pug can be obtained this way before dark). Around eight traps were placed in the surrounding area and started; the night stayed warm and the rain held off (amazingly). The list soon started to build up as I visited all of the traps to keep up-to-date with what species were being seen; by around midnight the amount coming in had diminished considerably so it was decided that, after another round, we would pack up. By around 01.30 the people who had traps had packed them up; one of our party was going to stay on overnight but he felt that he could be at risk so decided against it; the temperature was still not below 12 C. The total list was 79 (macro (64 sp.) and micromoths (15 sp. mostly det. by Bob Heckford)) and reflected the lack of moths we had so far seen on trips undertaken in Devon during 1997.

The more interesting of the species seen were *Hepialus sylvina* (L.) (Orange Swift), *H. fusconebulosa* (Deg.) (map-winged swift), *Atolmis rubricollis* (L.) (red-necked footman), *Cybosia mesomella* (L.) (four-dotted footman), *Diacrisia sannio* (L.) (clouded buff), *Xestia ditrapezium* ([D. & S.]) (triple-spotted clay) and *Laconobia contigua* (D. & S.) (beautiful brocade).

Eype's Mouth, near Bridport, and Abbotsbury, Dorset, 5 July 1997

Leaders: **Michael Salmon & Alan Stewart**. In spite of the remoteness of the sites, the meeting was attended by 14 members (including car loads from Cardiff and Sussex, plus visitors from Germany and The Natural History Museum). Although the day was particularly recommended to specialists in 'other orders', lepidopterists were very welcome and three appeared in the evening to operate mercury vapour lamps.

We spent the morning, in brilliant sunshine, examining the undercliff at Eype, before moving on to the coastal shingle and reed beds at Abbotsbury. One of the great delights at Eype is the fact that from the cliff-top car park one only has to walk about 300 yards before the crowd of sunbathing holiday makers are left behind. From then on the beach and undercliff are deserted for several miles. Because of its relative isolation the undercliff has not been fully explored although previous reports in the literature suggest that it is a goldmine of rare beetles and other insects. The undercliff supports a mixed vegetation of rough grasses, *Phragmites*, *Salix* spp. and *Myrica gale*. Freshwater rills are abundant. The area is densely overgrown and it is possible to be cut off by the incoming tide. Although the day was warm, a relatively small number of different species was found. However, amongst these were the tiger beetle *Cicindela germanica* L. (RDB3), the ground beetle *Drypta dentata* (Rossi)

Fig. 1. Michael Salmon collecting beetles at Eype undercliff.

Fig. 2. A pause for lunch on the cliff-top at Eype, Dorset.

(RDB1) and the weevil *Sitona gemellatus* Gyllenhal (RDB1). *C. germanica* was extremely abundant over a stretch of beach and undercliff for over a mile. Other beetles of note were *Eubria palustris* Germar (RDB3), *Rhinocyllus conicus* (Frölich) (Na) and *Mononychus punctumalbum* (Herbst) (Na). Apart from Coleoptera, other interesting species found were the bee-fly *Bombylius canescens* Mikan (Nb), soldier-fly *Oxycera pygmaea* (Fallén) (Nb) and the bees *Lasioglossum laticeps* (Schenck) (RDB2) and *L. puncticollis* (Morawitz, F.) (Nb).

After lunch on the cliff-top, during which we were visited by the landowner, Mrs R. Wingfield-Digby, to whom we are most grateful for allowing access, we moved on to Abbotsbury. The chosen site was a reserve at the western end of Chesil Bank, with extensive reed beds. In spite of the glorious weather very little of interest was found. The plant-hopper *Oliarus leporinus* (L.) (Nb) and the weevils *Sibinia arenariae* Stephens (Nb) and *Larinus planus* (Fab.) (Nb) were almost the only species of importance. Although Abbotsbury has proved to be a valuable entomological site in previous years, it proved to be so limited on this occasion that the view was expressed that we should have remained at Eype for the whole day.

Colaton Raleigh Common, Devon, 26 July 1997

Leader: **Roy McCormick**. The daytime event was very successful with a dry but windy day (at the meeting spot) but this did not worry us because we would be working in the shelter of trees and in a hollow. Eleven people turned up with the majority of these belonging to Butterfly Conservation; we were ably led by the Warden of the area, Doug Cullen. We formed a convoy of vehicles out of the car park with Doug in the lead and he took us to the site via lanes and tracks (anybody not knowing the area would have difficulty locating this site).

The main purpose for the day was butterfly recording with myself looking for moths, a few of which were flushed from bushes, and looking for possible sites for the night event. 14 species of butterflies were seen and the more significant of these were *Quercusia quercus* (L.) (purple hairstreak), *Ladoga camilla* (L.) (white admiral), *Polygonia c-album* (L.) (comma) and *Argynnis paphia* (L.) (silver-washed fritillary). A possible site for *Phlyctaenia stachydalis* (Germ.) a pyralid known in the south west, was seen; a whole bed of *Stachys* sp. was found in the deciduous wooded area. This would have to be considered for another year. Moths seen are listed below.

After an evening meal in Otterton we went back to the original car park to wait for the night people and our trusty guide, Doug; 9 arrived for this event, 4 members of Devon Moth Group (although 3 of these were also members of BENHS and Butterfly Conservation), 1 member of BENHS, 2 members of Butterfly Conservation and Doug and his wife. Doug led the convoy once more and we made our way on to the heath and boggy area where we set out our traps (the wind was affecting us slightly as we were more exposed but the night was quite warm (min. 16 C). With the traps running (we had 10) we examined areas of marsh grasses and bog and found a species of crambid not seen for a number of years in Devon, *Crambus uliginosellus* Zell., which was seen in numbers. We also found one of the smallest macromoths on our list and again in numbers: *Hypenodes humidalis* Doubl. (marsh oblique-barred) another species that is seriously under-recorded; both of these came readily to light.

As the night progressed the list went into the third column on my A4 page and by the end of the session there were 123 species of butterfly, micro and macromoth. Most of the micromoths were identified by Peter Baker and myself, with the final check being made by Bob Heckford at a later date. At around 00.30 species had

stopped coming in and it was decided that we may as well pack up; some of our visitors had already departed by this time. Dave Gibbs was going to stay all night so after we had packed up we said our good nights and wished him the best of luck (he only added a couple of species to the list for his efforts). Among the more interesting species seen, apart from the two mentioned, were *Acentria ephemerella* ([D. & S.]) (water veneer), *Eudonia pallida* (Curt.), *E. delunella* (Staint.), *Cataclysta lemnata* (L.) (small china-mark), *Dioryctria abietella* ([D. & S.]), *D. mutatella* Fuchs, *Buckleria paludum* (Zell.). A further species that has not been seen for some time; *Rheumaptera undulata* (L.) (scallop shell), *Eupithecia inturbata* (Hübn.) (maple pug), *Pachycnemia hippocastanaria* (Hübn.) (horse chestnut), *Gnophos obscuratus* ([D. & S.]) (The annulet), *Clostera curtula* (L.) (chocolate tip), *Mythimna pudorina* ([D. & S.]) (striped wainscot), *Protodeltote pygarga* (Hufn.) (marbled white spot), *Phytometra viridaria* (Cl.) (small purple-barred) and *Schrankia costaestrigalis* (Steph.) (pinion-streaked snout). The numbers of micromoths were 32, 14 butterflies and macromoths at 77. One of the better nights of recording in Devon in 1997.

Wicken Fen, Cambridgeshire, 17 August 1997

Leader: **Ivan Perry**. Seventeen members and friends attended this meeting on what was one of the hottest days of the year. Down on the fen there was hardly a breath of air and very little shade, but undaunted we laboured on and obtained some useful records. The Angelica heads were crammed full of insects, mostly common hoverflies including the melanistic var *unicolor* of *Scaeva pyrastri* (L.), but also surprisingly several *Triglyphus primus* Loew and a single *Chrysotoxum bicinctum* (L.), not seen on the fen since 1926. Other Diptera present included the soldier-fly *Stratiomys singularior* (Harris) which occurs regularly at Wicken and the anthomyid *Calythea nigricans* (Rob.-Des.) which was new to the reserve. On St Edmunds Fen the chloropid fly *Oscinomorpha sordissima* (Strobl) was a surprise discovery as its usual habitat is short calcareous grassland.

The Brick Pits were sampled for water beetles and among those found were *Agabus undulatus* (Schr.), *Hydrochus carinatus* Germ. and *Limnebius aluta* (Bedel). During the afternoon attention switched to some of the ditches on Adventurers Fen where *A. undulatus* was again present along with *Limnebius papposus* Muls. A few late examples of the bee *Macropis labiata* (Fab.) were seen visiting Yellow Loosestrife *Lysimachia vulgaris* L. and vacated mines of the micro-moth *Acrocercops imperialella* (Zell.) were found on Comfrey *Symphytum officinale* L.

During the afternoon insect activity and that of their pursuers inevitably slowed down in the oppressive heat. Several found the visitor centre and its ice creams an irresistible attraction, as thunder rumbled on in the distance threatening to bring some welcome relief.

New Forest, Hampshire, 11 October 1997

Leaders: **Ray Cook & Tony Pickles**. This field meeting was specifically to follow up last year's discovery of *Agrochola haematidea* Dup. the southern chestnut, in the New Forest. It was hoped to extend the known range and obtain some indication of whether or not this species was newly arrived in Hampshire, or long established.

Because this noctuid moth flies for a limited period, around dusk only, the meeting was convened for five in the afternoon and members were allocated sites in the west of the Forest which the leaders thought were likely to support the species.

Knowledge of the Sussex locality and the known distribution in the Forest was used to determine these trapping sites.

In the event the weather was atrocious with strong westerly winds bringing squally showers alternating with a nearly full moon. The leaders were therefore gratified and surprised at the enthusiasm for the meeting. Fourteen members and friends turned out for what could have been a thankless task. Only fourteen species of moths were seen [*Thera firmata* (Hübn.) pine carpet, *Thera obeliscata* (Hübn.) grey pine carpet, *Thera britannica* (Turn.) spruce carpet, *Gymnoscelis rufifasciata* (Haw.) double-striped pug, *Pachycnemia hippocastanaria* (Hübn.) horse chestnut, *Noctua pronuba* (L.) large yellow underwing, *Aporophyla nigra* (Haw.) black rustic, *Conistra vaccinii* (L.) the chestnut, *Conistra ligula* (Esp.) dark chestnut, *Agrochola lota* (Cl.) red-line quaker, *Agrochola macilenta* (Hübn.) yellow-line quaker, *Agrochola helvola* (L.) flounced chestnut, *Agrochola lychnidis* ([D. & S.]) beaded chestnut, *Agrochola haematidea* Dup. southern chestnut], one for each attendee, but when the members met up later in a pub in Burley, to warm up and debrief, the few *haematidea* seen had extended the known range to the whole of the area of New Forest west of a line drawn from Brockenhurst through Lyndhurst and extending north. The majority of the localities are centred on Linford and the Stony Cross area. Several recorders had worked this area in the days leading up to the field meeting and continued to work this and likely looking spots to the east of the Forest in the ensuing fortnight.

It is no doubt too early to draw strong conclusions, but it appears that the moth is mostly associated with tall mature bell heather *Erica cinerea* L. growing in drier biotopes, although the one larva so far found in the Forest was on cross-leaved heath *E. tetralix* L. So far no specimen has been found east of the line through Brockenhurst and Lyndhurst in spite of fairly extensive trapping on good nights this year and in 1992. On the whole the heather to the east is shorter and more regularly burned. So, if it is true that the species is absent or more scarce to the east, it would support the contention that the insect had been overlooked in the New Forest as the east is better known by lepidopterists. Few recorders would have light trapped the Forest heaths round dusk in October. At the time when the larvae which are most frequently obtained on heather in the Forest are mature, those of *haematidea* are small and unremarkable. If such larvae had been taken casually they could well have died in captivity because of a lack of understanding of their specialized needs. Therefore, it seems to us that *haematidea* could well have been overlooked here for some time. Although only low numbers of the moth have been seen on any occasion it seems that its wide distribution means it is not threatened. However, the need for suitable stands of mature bell heather to be maintained should be emphasized. Work to establish its range and requirements more fully should be continued and it is intended to hold a further Field Meeting in the autumn of 1998 to concentrate on the east of the Forest. We hope members will be as generous with their time as in 1997.

We would like to thank those members who attended the meeting and who submitted the results of their subsequent recording. Also the Forestry Commission for allowing the meeting and especially Andy Page of the Commission who attended this meeting with his leg in plaster. The original New Forest specimen was trapped by him and identified and reported by Ray Cook. Copies of this report have been lodged with the Forestry Commission and the National Moth Recording Network.

THE BRITISH ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY RESEARCH FUND

The following grants were made from the fund in 1997: Dr M. E. Archer, £300, to assist with a survey and comparison of the aculeate wasps and bees of selected Northumbrian sand dunes; Mr R. F. McCormick, £300, to help finance the running costs of the Devon Moth Group; Mr J. E. Milner, £345, to assist with the travel and accommodation costs of fieldwork in the Shetland Isles to survey the invertebrate fauna of native woodland sites; Dr M. G. Morris, £255, to meet the costs of visits to the Natural History Museum in London to use the collections in connection with the preparation of handbooks for the identification of British weevils.

The Society now invites applications for grants to be awarded in December 1998. Awards will be made to support research on insects and spiders with reference to the British fauna, and with emphasis on:

(a) the assistance of fieldwork on insects with relevance to their conservation,
(b) work leading to the production of identification guides and distribution lists.

Travel to examine museum collections and to consult taxonomic specialists would be included. The work and travel is not limited to the British Isles but must have a demonstrable relevance to the British insect or spider fauna. Grants are likely to be in the region of £300 and the total available will not exceed £1500.

Preference will be given to work with a clear final objective (e.g., leading to publication or the production of a habitat management plan). Work on leaf miners and gall forming insects should be submitted to the Society's Professor Hering Memorial Research Fund.

Applicants should send seven copies, if possible, of their plan of work, the precise objects, the amount for which an award is requested and a brief statement outlining their experience in this area of work, to Dr J. Muggleton, 30 Penton Road, Staines, Middlesex TW18 2LD, as soon as possible and not later than 30 September 1998. Further information may be obtained from the same address.

THE PROFESSOR HERING MEMORIAL RESEARCH FUND

The British Entomological and Natural History Society announces that awards may be made from this Fund for the promotion of entomological research with particular emphasis on:

(a) leaf-miners
(b) Diptera, particularly Tephritidae and Agromyzidae
(c) Lepidoptera, particularly Microlepidoptera
(d) general entomology

in the above order of preference having regard to the suitability of applicants and the plan of work proposed.

Awards may be made to assist travelling and other expenses necessary for fieldwork, for the study of collections, for attendance at conferences, or, exceptionally, for the costs of publication of finished work. In total they are unlikely to exceed £600 in 1999.

Applicants should send six copies, if possible, of a statement of their qualifications, of their plan of work, and of the precise objects and amount for which an award is sought, to Dr M. J. Scoble, Department of Entomology, The Natural History Museum, Cromwell Road, London SW7 5BD, as soon as possible and not later than 30 September 1998.

Applications are also invited from persons wishing to borrow the Wild M3 stereomicroscope and fibre optics illuminator bequeathed to the Fund by the late Edward Pelham-Clinton, 10th Duke of Newcastle. Loan of this equipment will be made for a period of up to six months in the first instance.

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